

Wednesday, February 17, 2010

REQUEST NUMBER: 10-1913

Page 1 of 1

**LOS ALAMOS**  
**NATIONAL LABORATORY**

ATTN: Valerie Davis

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd

Charleston, SC 29407

These Samples are on:

LANL Request Number: 10-1913

Per Agreement Number: 126310011

Project Cost Code: MR3A05529E00

Please analyse the enclosed samples  
according to the schedule indicated:

SHIP DATE: 2/17/2010

TURNAROUND/REPORT DUE: 3/19/2010

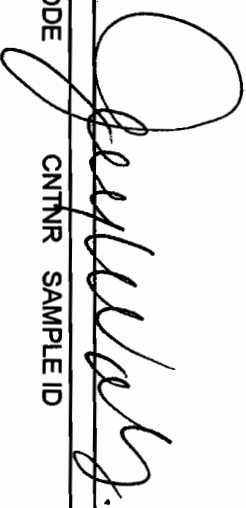
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
EPA:906.0		1	RE15-10-8240	R	2/13/2010	
		1	RE15-10-8241	R	2/13/2010	
		1	RE15-10-8242	R	2/13/2010	
		1	RE15-10-8243	R	2/13/2010	
		1	RE15-10-8244	R	2/13/2010	
		1	RE15-10-8245	R	2/13/2010	
		1	RE15-10-8246	R	2/13/2010	
		1	RE15-10-8267	R	2/13/2010	

Wednesday, February 17, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 10-1913

## LOS ALAMOS

REQUEST NUMBER: 10-1913

## NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/19/2010

General Engineering Laboratories, Inc.,  
Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

## LAB REQUEST COMMENTS:

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
RE15-10-8246	1	POLY	H3	Ice	R
RE15-10-8245	1	POLY	H3	Ice	R
RE15-10-8243	1	POLY	H3	Ice	R
RE15-10-8244	1	POLY	H3	Ice	R
RE15-10-8242	1	POLY	H3	Ice	R
RE15-10-8240	1	POLY	H3	Ice	R
RE15-10-8241	1	POLY	H3	Ice	R
RE15-10-8267	1	POLY	H3	Ice	R

Relinquished By:

Date

Time

Received By:

Date

Time

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Printed Name

Signature

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8240

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		02/13/2010		MEDIA:		QBT3	
TIME COLLECTED (HH:MM)		09:55		SUB-MEDIA:		TUFF 1	
PRS ID:	15-007(d)	OK		SAMPLE TECH CODE:		HA	
LOCATION ID:	15-610819			FIELD QC TYPE:		NA	
LOCATION TYPE:	GENERIC			FIELD PREP:		NA	
TOP DEPTH:	0	4.0 ft		SAMPLE USAGE:		INV	
BOTTOM DEPTH:	0	5.0 ft		SCREEN/PORT DESC:		NA	
FIELD MATRIX:	R	OK		EXCAVATED: YES/NO/NA		NA	
COMPOSITE TYPE: NA		COMPOSITE TIME INTERVAL: NA		WATER FLOWING: YES/NO/NA		NA	
BOREHOLE: YES/NO/NA		BOREHOLE DECLINATION: -90°		BOREHOLE DIRECTION: NA			

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	8082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+ClO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

SAMPLE DESC:

Light gray, non indurated, non welded, devitrified, dry, ash flow tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

FIELD SCREENING/MEASUREMENT RESULTS:

HE Spot Test + Negative  
Alpha = 23 dpm  
Beta/Gamma = 2028 dpm  
2280

ARM 2/13/10  
PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

L. Lopez

REVIEWED BY (PRINT) J. Marin

RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name) JON MARIN	2/13/10	(Printed Name)	2/13/10
(Signature) Jon R. Marin	1442	(Signature)	2:40
RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name)		(Printed Name)	
(Signature)		(Signature)	

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8241

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		02/13/2010		MEDIA:	QBT3		OK
TIME COLLECTED (HH:MM)		11:45		SUB-MEDIA:	TUFF 1		OK
PRS ID:	15-007(d)	OK		SAMPLE TECH CODE:	HA		CBS
LOCATION ID:	15-610819			FIELD QC TYPE:	NA		OK
LOCATION TYPE:	GENERIC			FIELD PREP:	NA		
TOP DEPTH:	0	19.0 ft		SAMPLE USAGE:	INV		
BOTTOM DEPTH:	0	20.0 ft		SCREEN/PORT DESC:			NA
FIELD MATRIX:	R	OK		EXCAVATED: YES/NO	NA		
COMPOSITE TYPE:	NA			COMPOSITE TIME INTERVAL:	NA		WATER FLOWING: YES/NO NA
BOREHOLE:	YES/NO/NA			BOREHOLE DECLINATION:	-90°		BOREHOLE DIRECTION: NA

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	8082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+CIO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

## SAMPLE DESC:

Light gray, non indurated, nonwelded, devitrified, dry, ash flow tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha  $\pm$  47 dpm  
Beta/Gamma  $\pm$  2600 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

REVIEWED BY (PRINT) J. MARIN

L. Lopez

RELINQUISHED BY (Printed Name) JON MARIN (Signature) Jon R. Marin	Date/Time 2/13/10 1442	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/10 2:42
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8242

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		02/13/2010		MEDIA:	QBT3		OK
TIME COLLECTED (HH:MM)		12:15		SUB-MEDIA:	TUFF 1		OK
PRS ID:	15-007(d)	OK		SAMPLE TECH CODE:	HA		CBS
LOCATION ID:	15-610819			FIELD QC TYPE:	NA		OK
LOCATION TYPE:	GENERIC			FIELD PREP:	NA		
TOP DEPTH:	0	33.0 ft		SAMPLE USAGE:	INV		
BOTTOM DEPTH:	0	35.0 ft		SCREEN/PORT DESC:		NA	
FIELD MATRIX:	R	OK		EXCAVATED: YES/NO/NA			
COMPOSITE TYPE:	NA			COMPOSITE TIME INTERVAL:	NA		WATER FLOWING: YES/NO/NA
BOREHOLE:	YES/NO/NA			BOREHOLE DECLINATION:	-90°		BOREHOLE DIRECTION:
							NA

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	2082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+ClO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

SAMPLE DESC:

Light brownish gray, slightly indurated, nonwelded, devitrified, dry, ash flow tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

FIELD SCREENING/MEASUREMENT RESULTS:

Alpha  $\leq$  17 dpm  
Beta/Gamma  $\leq$  2400 dpm

213/110  
PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

REVIEWED BY (PRINT) J. MARIN

RELINQUISHED BY (Printed Name) JON MARIN (Signature) J. Marin	Date/Time 2/13/10 1442	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/10 2:42
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8243

WORK ORDER:

AS PLANNED		AS COLLECTED	AS PLANNED		AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		02/13/2010	MEDIA:	QBT3	OK
TIME COLLECTED (HH:MM)		12:31	SUB-MEDIA:	TUFF1	OK
PRS ID:	15-007(d)	OK	SAMPLE TECH CODE:	HA	CBS
LOCATION ID:	15-610819		FIELD QC TYPE:	NA	OK
LOCATION TYPE:	GENERIC		FIELD PREP:	NA	
TOP DEPTH:	0	49.0 ft	SAMPLE USAGE:	INV	
BOTTOM DEPTH:	0	50.0 ft	SCREEN/PORT DESC:		NA
FIELD MATRIX:	R	OK	EXCAVATED: YES/NO/NA		
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA	
BOREHOLE: YES/NO/NA			WATER FLOWING: YES/NO/NA		
BOREHOLE DECLINATION:	-90°		BOREHOLE DIRECTION:	NA	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	8082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+ClO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

## SAMPLE DESC:

Light brownish gray, non indurated, non welded, devitrified, dry, ash flow tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha  $\leq 53$  dpm  
Beta/Gamma  $\leq 250$  dpm

PID  $\frac{\text{Ambient Reading}}{\text{ppm}} = \text{ppm}$

COLLECTED BY (PRINT)

REVIEWED BY (PRINT) J. Marin

RELINQUISHED BY (Printed Name) JORV MARIN (Signature) J. R. Marin	Date/Time 2/13/10 1442	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/10 2:42
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8244

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		02/13/2010		MEDIA:		QBT3	
TIME COLLECTED (HH:MM)		1300		SUB-MEDIA:		TUFF 1	
PRS ID:	15-007(d)	OK		SAMPLE TECH CODE:		HA	
LOCATION ID:	15-610819			FIELD QC TYPE:		NA	
LOCATION TYPE:	GENERIC			FIELD PREP:		NA	
TOP DEPTH:	0	64 ft		SAMPLE USAGE:		INV	
BOTTOM DEPTH:	0	65 ft		SCREEN/PORT DESC:		NA	
FIELD MATRIX:	R	OK		EXCAVATED: YES/NO/NA		NA	
COMPOSITE TYPE: NA		COMPOSITE TIME INTERVAL: NA		WATER FLOWING: YES/NO/NA		NO	
BOREHOLE: YES/NO/NA		BOREHOLE DECLINATION: -90°		BOREHOLE DIRECTION: NA			

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	8082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+ClO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

## SAMPLE DESC:

Light gray, non indurated, non welded, devitrified, dry, ash flow tuff.

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha = 89 dpm  
Beta/Gamma = 2170 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

L. Lopez

REVIEWED BY (PRINT)

J. M. Aguilin

RELINQUISHED BY (Printed Name) JON MARIN (Signature) Jon R. Marin	Date/Time 2/13/10 1442	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/10 2142
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8245

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		02/13/2010	MEDIA:	QBT3		OK	
TIME COLLECTED (HH:MM)		13:25	SUB-MEDIA:	TUFF 1		OK	
PRS ID:	15-007(d)	OK	SAMPLE TECH CODE:	HA		CBS	
LOCATION ID:	15-610819		FIELD QC TYPE:	NA		OK	
LOCATION TYPE:	GENERIC		FIELD PREP:	NA			
TOP DEPTH:	Q	79.0 ft	SAMPLE USAGE:	INV			
BOTTOM DEPTH:	Q	80.0 ft	SCREEN/PORT DESC:			N/A	
FIELD MATRIX:	R	OK	EXCAVATED: YES/NO/NA				
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA		WATER FLOWING: YES/NO/NA	
BOREHOLE:	YES/NO/NA		BOREHOLE DECLINATION:	-90°		BOREHOLE DIRECTION:	NA

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	ARM 2/13/10 8082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+ClO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

SAMPLE DESC:

Light gray, slightly indurated, nonwelded, dehydrified

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

FIELD SCREENING/MEASUREMENT RESULTS:

Alpha  $\leq$  47 dpm  
Beta/Gamma  $\leq$  2450 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

L. Lopez

REVIEWED BY (PRINT) J. Marin

RELINQUISHED BY (Printed Name) JON MARIN (Signature) Jon R. Marin	Date/Time 2/13/10 1442	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/10 2:42
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8246

WORK ORDER:

AS PLANNED		AS COLLECTED		AS PLANNED		AS COLLECTED	
DATE COLLECTED(MM/DD/YYYY):		02/13/2010		MEDIA:	OBT3		OK
TIME COLLECTED (HH:MM)		13:50		SUB-MEDIA:	TUFF 1		OK
PRS ID:	15-007(d)	OK		SAMPLE TECH CODE:	HA		CBS
LOCATION ID:	15-610819			FIELD QC TYPE:	NA		OK
LOCATION TYPE:	GENERIC			FIELD PREP:	NA		
TOP DEPTH:	0	104.0 ft		SAMPLE USAGE:	INV		
BOTTOM DEPTH:	0	105.0 ft		SCREEN/PORT DESC:			NA
FIELD MATRIX:	R	OK		EXCAVATED: YES/NO/NA			
COMPOSITE TYPE:	NA			COMPOSITE TIME INTERVAL:	NA		WATER FLOWING: YES/NO/NA
BOREHOLE: YES/NO/NA				BOREHOLE DECLINATION:	-90°		BOREHOLE DIRECTION:
							NA

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	8082+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+CIO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

SAMPLE DESC:

Light Gray, Non indurated, Non welded, devitrified, dry, ash flow tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

FIELD SCREENING/MEASUREMENT RESULTS:

Alpha  $\leq$  41 dpm  
 Beta/Gamma  $\leq$  2230 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

REVIEWED BY (PRINT)

RELINQUISHED BY

(Printed Name) JON MARIN

(Signature) Jon R. Marin

Date/Time

2/13/10

1442

RECEIVED BY

(Printed Name)

(Signature)

Date/Time

2/13/10

2:40

RELINQUISHED BY

(Printed Name)

(Signature)

Date/Time

RECEIVED BY

(Printed Name)

(Signature)

Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8267

WORK ORDER:

AS PLANNED		AS COLLECTED	AS PLANNED		AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		02/13/2010	MEDIA:	QBT3	OK
TIME COLLECTED (HH:MM)		12:15	SUB-MEDIA:	TUFF 1	OK
PRS ID:	15-007(d)	OK	SAMPLE TECH CODE:	HA	CBS
LOCATION ID:	UNK	15-610 819	FIELD QC TYPE:	FD	OK
LOCATION TYPE:	GENERIC	OK	FIELD PREP:	NA	
TOP DEPTH:	0	33.0 ft	SAMPLE USAGE:	QC	
BOTTOM DEPTH:	0	35.0 ft	SCREEN/PORT DESC:		NA
FIELD MATRIX:	R	OK	EXCAVATED: YES/NO/NA		
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA	
			WATER FLOWING: YES/NO/NA		
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: -90°		
			BOREHOLE DIRECTION:	NA	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	12m 2/13/10 882+NMED-HEXP	250 ML AMBER GLASS	Ice	Y	
1		H3	500 ML POLY	Ice	Y	
1		Metals+ClO4+CN	500 ML POLY	Ice	Y	
1		RADVANA+B+G	1 EA 8 IN RESEALABLE POLY BAG	None	Y	

SAMPLE DESC: QC Sample of RE15-10-8242

brownish  
Light gray, slightly indurated, nonwelded, devitrified, dry, ark flow  
tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha  $\leq 17$  dpm  
Beta/Gamma  $\leq 2400$  dpmPID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$ 

COLLECTED BY (PRINT)

L. Lopez

REVIEWED BY (PRINT)

J. MARIN

RELINQUISHED BY (Printed Name) JON MARIN (Signature) Jon B. Marin	Date/Time 2/13/10 1442	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/13/10 2:42
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2504

EVENT NAME: 4th Qtr. FY09 - SWMU 15-007(d) - Threemile Canyon

SAMPLE ID: RE15-10-8270

WORK ORDER:

AS PLANNED		AS COLLECTED	AS PLANNED		AS COLLECTED
DATE COLLECTED(MM/DD/YYYY):		02/13/2010	MEDIA:	NA	OK
TIME COLLECTED(HH:MM)		14:10	SUB-MEDIA:	OTHER	
PRS ID:	15-007(d)	OK	SAMPLE TECH CODE:	DC	
LOCATION ID:	UNK	15-610819	FIELD QC TYPE:	ER	
LOCATION TYPE:	GENERIC	OK	FIELD PREP:	UF	
TOP DEPTH:	0	0	SAMPLE USAGE:	QC	
BOTTOM DEPTH:	0	0	SCREEN/PORT DESC:		N/A
FIELD MATRIX:	W	OK	EXCAVATED: YES/NO/NA		
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA	
			WATER FLOWING: YES/NO/NA		
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: -90°		
			BOREHOLE DIRECTION: NA		

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1	Normal	METALS-GEL	1 LITER POLY	Nitric Acid	Y	
1	1	SW-846:6850	250 ML POLY	Ice	Y	
1	1	TCN	500 ML POLY	Sodium Hydroxide	Y	

SAMPLE DESC: QC Sample of RE15-10-8246

SAMPLE COMMENTS: NA

LOCATION DESC: 7d-1

FIELD SCREENING/MEASUREMENT RESULTS: NA

COLLECTED BY (PRINT)

L. Lopez

REVIEWED BY (PRINT)

J. MARIN

RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name) JON MARIN	2/13/10	(Printed Name)	2/13/10
(Signature) Jon R. Marin	1442	(Signature)	2:40
RELINQUISHED BY	Date/Time	RECEIVED BY	Date/Time
(Printed Name)		(Printed Name)	
(Signature)		(Signature)	

## Rad Screening Data Release Form

The Following samples were received at the Field Support Facility (FSF) without screening data (list sample number):

RE15-10-8245  
8246  
8243  
8242  
8241  
8240  
8244  
8267

These samples will not be shipped until radiological screening data documentation arrives at the FSF. I understand that it is my responsibility to ensure this information arrives at the FSF in a timely manner. If holding times are missed because screening data does not arrive, I will pick up the samples.

.....

The following samples do not require rad screening data for the reasons stated (list sample numbers):

RE15-10-8270

Reason: Ringside

.....

Print Last Name McFarland Signature Tracy M Date 2/13/10

## DATA VALIDATION COVER SHEET

5119-1

## Data Validation Cover Sheet

Records Use only



## Section I.

REQUEST NUMBER: 10-1913 VALIDATION DATE: 04/15/10 LAB CODE: GELCONTRACT LABORATORY NAME: GEL Laboratories LLCVALIDATOR: Monica Dymerski ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- |  |  |   |  |
|--|--|---|--|
| <input type="checkbox"/> TPH-GRO                                 | <input type="checkbox"/> HIGH EXPLOSIVES           | <input type="checkbox"/> DIOXIN FURANS          | <input type="checkbox"/> LCMSMS PERCHLORATES |
| <input type="checkbox"/> TPH-DRO                                 | <input type="checkbox"/> METALS                    | <input type="checkbox"/> PCB CONGENERS          | <input type="checkbox"/> ORGANOCHLORINE      |
| <input type="checkbox"/> GENERAL CHEMISTRY                       | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH EXPLOSIVES | PESTICIDES/POLYCHLORINATED BIPHENYLS         |
| <input type="checkbox"/> OTHER (DESCRIBE): tritium analysis only |  |   |  |


## Section II. Completeness Check

- | YES                                 | NO                       | N/A                                 | (CHECK ONE)                 | YES                                 | NO                       | N/A                                 | (CHECK ONE)              |
|-------------------------------------|--------------------------|-------------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 1. CHAIN-OF-CUSTODY FORM(S) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 6. RAW/BSS DATA          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 2. CASE NARRATIVE           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 7. QUALITY CONTROL FORMS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 3. SAMPLE RESULT FORMS      | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8. QUANTITATION REPORTS  |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. SAMPLE CHROMATOGRAMS     | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 9. TICS FORMS            |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. STANDARD CHROMATOGRAMS   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10. TICS MASS SPECTRA    |

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

1. A tritium MS was not analyzed for the batch associated with samples RE46-10-8246, -8243, -8244, and -8240. An LCS analysis was performed and met QC acceptance criteria. No sample data were qualified as a result.
2. The sample duplicate analysis was performed on a LANL sample from another RN for the batch associated with samples RE46-10-8246, -8243, -8244, and -8240. No sample data were qualified as a result.


Reviewed by: Susan BallLevel: IDate: 04/16/10VALIDATOR'S SIGNATURE: Monica DymerskiDATE: 04/15/10

RAD ANALYTICAL DATA VALIDATION CHECKLIST	
<b>5119-2</b>  <b>Rad Analytical Data Validation Checklist</b>	Records Use only _____  

Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ, R9	J-, R9
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The holding time was >2 times the applicable holding time requirement.	R, R9a	J-, R9a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The results for the affected analytes are considered not detected (U) because the associated sample concentration was less than or equal to the MDC.	U, R5	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.	R, R5a	R, R5a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. The MDC and/or TPU documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R5b	J-, R5b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6. The results for the affected analytes should be regarded as not detected (U) because the associated sample concentration was less than 3X the 1 sigma TPU.	U, R11	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. The sample result is ≤5X the concentration of the related analyte in the method blank.	U, R4	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X.	N/A	J, R4a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. The sample result is ≤5X the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.	U, R4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R4e	R, R4e
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11. The tracer is <10%R. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3	R, R3

RAD ANALYTICAL DATA VALIDATION CHECKLIST	
<b>5119-2</b>  <b>Rad Analytical Data Validation Checklist</b>	Records Use only _____  

Yes No N/A				Assign Qualifier Listed Below If Criterion = Yes	
(Check One)				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12. The tracer is < the Lower Acceptance Level (LAL) but $\geq 10\%R$ . Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	UJ, R3a	J-, R3a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13. The Tracer%R value is > the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	N/A	J+, R3b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14. Required tracer information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3d	R, R3d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. The LCS percent recovery was <10%. Follow the external laboratory limits located within the associated data package.	R, R12	R, R12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.	UJ, R12a	J-, R12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. The LCS percent recovery was > the UAL. Follow the external laboratory limits located within the associated data package.	N/A	J+, R12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R12c	R, R12c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Associated duplicate sample has DER or RER > the analytical laboratory's acceptance limits.	R, R10	J, J10
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	20. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R6	R, R6

RAD ANALYTICAL DATA VALIDATION CHECKLIST	
<b>5119-2</b>  <b>Rad Analytical Data Validation Checklist</b>	Records Use only _____  

Yes   No   N/A (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6	R, R6
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6a	J-, R6a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	23. The associated matrix spike recovery was above the UAL. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6b	J+, R6b
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If LCS information is present, do not Reject. Qualify data based on LCS information. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6c	R, R6c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. Duplicate, dilution, or reanalysis.	UJ, R88	J, R88
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, R19	J, R, R19
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Quantification of data via data validation did not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.	U, U_LAB	J, J_LAB NQ, NQ



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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8246  
Sample ID: 247356001  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		3.22E+05	700	+/-22700	250	pCi/L		KXK2	03/03/10	1922	956740	1

#### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

#### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

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04/15/10

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8245  
Sample ID: 247356002  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		13.1	4.49	+/-2.18	6.00	pCi/g		GXR1	04/08/10	1936	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

#### Notes:

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8243  
Sample ID: 247356003  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		3.42E+06	3240	+/-2.41E+05	250	pCi/L		KXK2	03/03/10	1934	956740	1

#### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

#### Notes:

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8244  
Sample ID: 247356004  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		7.17E+05	1030	+/-50500	250	pCi/L		KXK2	03/03/10	1936	956740	1

### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

#### Notes:

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8242  
Sample ID: 247356005  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		60.2	4.47	+/-7.33	6.00	pCi/g		GXR1	04/08/10	2039	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

#### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8240  
Sample ID: 247356006  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		3.62E+05	805	+/-25500	250	pCi/L		KXK2	03/03/10	1942	956740	1

### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

#### Notes:

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- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
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- UJ Gamma Spectroscopy--Uncertain identification
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- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

MLD  
04/15/10

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8241  
Sample ID: 247356007  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		50.7	4.38	+/-6.24	6.00	pCi/g		GXR1	04/08/10	2141	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

#### Notes:

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
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- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
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- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

MLD  
04/15/10

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8267  
Sample ID: 247356008  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		64.1	4.49	+/-7.79	6.00	pCi/g		GXR1	04/08/10	2244	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

#### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

MLD  
04/15/10



Wednesday, February 17, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 10-1913

LOS ALAMOS

REQUEST NUMBER: 10-1913

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/19/2010

General Engineering Laboratories, Inc.,  
Charleston, SC,

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

247356%

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
RE15-10-8246	1	POLY	H3	Ice	R
RE15-10-8245	1	POLY	H3	Ice	R
RE15-10-8243	1	POLY	H3	Ice	R
RE15-10-8244	1	POLY	H3	Ice	R
RE15-10-8242	1	POLY	H3	Ice	R
RE15-10-8240	1	POLY	H3	Ice	R
RE15-10-8241	1	POLY	H3	Ice	R
RE15-10-8267	1	POLY	H3	Ice	R

Relinquished By:

Date

Time

Received By:

Date

Time

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Printed Name

Signature

**LOS ALAMOS  
NATIONAL LABORATORY**

**General Engineering Laboratories, Inc., Charleston, SC.**

**Charleston, SC 29407**

**LANL Request Number: 10-1913**

Per Agreement Number: 126310011

**Project Cost Code: MR3A05529E00**

**Please analyse the enclosed samples according to the schedule indicated:**

SHIP DATE: 2/17/2010

**TURNAROUND/REPORT DUE: 3/19/2010**

**TURNAROUND REQ'D: 30 Days**

### **RAD SCREENING: Yes, Below Background**

**LAB REQUEST COMMENTS:**

**LANL ER SMO CONTACT:**

**Signature:**

DE CNTNR SAMPLE ID

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA-906.0	1	RE15-10-8240	R	2/13/2010	
		1	RE15-10-8241	R	2/13/2010	
		1	RE15-10-8242	R	2/13/2010	
		1	RE15-10-8243	R	2/13/2010	
		1	RE15-10-8244	R	2/13/2010	
		1	RE15-10-8245	R	2/13/2010	
		1	RE15-10-8246	R	2/13/2010	
		1	RE15-10-8267	R	2/13/2010	

**Final Page of REQUEST NUMBER 10-1913**



April 15, 2010

[www.gel.com](http://www.gel.com)

Ms. Joylene Valdez  
Los Alamos National Laboratory  
PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm111  
Los Alamos, New Mexico 87545

Re: LANL ER Project  
Work Order: 247356  
SDG: 10-1913

Dear Ms. Valdez:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 18, 2010, and analyzed for Radiochemistry. This report has been revised to reflect corrected Tritium data for samples RE15-10-8245, RE15-10-8242, RE15-10-8241, and RE15-10-8267.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Valerie Davis  
Project Manager

Purchase Order: 72733-001-09  
Chain of Custody: 10-1913  
Enclosures

**Los Alamos National Laboratory (72733-001-09)**  
**LANL ER Project**  
**Work Order #: 247356**  
**SDG: 10-1913**

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# Case Narrative

**Case Narrative for  
Los Alamos National Laboratory (72733-001-09)  
LANL ER Project  
Workorder #: 247356  
SDG # : 10-1913**

**February 22, 2010**

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on February 18, 2010 for analysis. The samples were prepared/analyzed within the required holding time. Shipping container temperatures were checked, documented, and within specifications. The samples were screened according to GEL Standard Operating Procedure. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. The containers for radiochemistry were received at 10C temperature. Shipping container temperature was within specification (0 - 6C).

**Sample Identification** The laboratory received the following samples:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
247356001	RE15-10-8246
247356002	RE15-10-8245
247356003	RE15-10-8243
247356004	RE15-10-8244
247356005	RE15-10-8242
247356006	RE15-10-8240
247356007	RE15-10-8241
247356008	RE15-10-8267

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package** The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.



Valerie Davis  
Project Manager

**List of current GEL Certifications as of 22 February 2010**

<b>State</b>	<b>Certification</b>
Arizona	AZ0668
Arkansas	88-0651
CLIA	42D0904046
California – NELAP	01151CA
Colorado	GEL
Connecticut	PH-0169
Dept. of Navy	NFESC 413
EPA Region 5	WG-15J
Florida – NELAP	E87156
Georgia	E87156 (FL/NELAP)
Georgia DW	967
Hawaii	N/A
ISO 17025	2567.01
Idaho	SC00012
Illinois – NELAP	200029
Indiana	C-SC-01
Kansas – NELAP	E-10332
Kentucky	90129
Louisiana – NELAP	03046
Maryland	270
Massachusetts	M-SC012
Nevada	SC00012
New Jersey – NELAP	SC002
New Mexico	FL NELAP E87156
New York – NELAP	11501
North Carolina	233
North Carolina DW	45709
Oklahoma	9904
Pennsylvania – NELAP	68-00485
South Carolina	10120001/10120002
Tennessee	TN 02934
Texas – NELAP	T104704235-07B-TX
U.S. Dept. of Agriculture	S-52597
Utah – NELAP	GEL
Vermont	VT87156
Virginia	00151
Washington	C1641



# **Chain of Custody and Supporting Documentation**

Wednesday, February 17, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 10-1913

LOS ALAMOS

REQUEST NUMBER: 10-1913

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/19/2010

General Engineering Laboratories, Inc.,  
Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

247356%

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
RE15-10-8246	1	POLY	H3	Ice	R
RE15-10-8245	1	POLY	H3	Ice	R
RE15-10-8243	1	POLY	H3	Ice	R
RE15-10-8244	1	POLY	H3	Ice	R
RE15-10-8242	1	POLY	H3	Ice	R
RE15-10-8240	1	POLY	H3	Ice	R
RE15-10-8241	1	POLY	H3	Ice	R
RE15-10-8267	1	POLY	H3	Ice	R

Relinquished By:

Date

Time

Received By:

Date

Time

Printed Name

Signature

2/17/10

1400

Printed Name

Signature

Patricia Dover-Dent P.D-Dent 2/18/10 08:45

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Printed Name

Signature

Wednesday, February 17, 2010  
**LOS ALAMOS**  
 NATIONAL LABORATORY

ATTN: Valerie Davis  
 General Engineering Laboratories, Inc., Charleston, SC.  
 2040 Savage Rd  
 Charleston, SC 29407

Please analyse the enclosed samples  
 according to the schedule indicated:

SHIP DATE: 2/17/2010  
 TURNAROUND/REPORT DUE: 3/19/2010  
 TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background  
 LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:  
 Signature: 

Page 1 of 1  
 REQUEST NUMBER: 10-1913  
 These Samples are on:  
 LANL Request Number: 10-1913  
 Per Agreement Number: 126310011  
 Project Cost Code: MR3A05529E00

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	RE15-10-8240	R	2/13/2010	
		1	RE15-10-8241	R	2/13/2010	
		1	RE15-10-8242	R	2/13/2010	
		1	RE15-10-8243	R	2/13/2010	
		1	RE15-10-8244	R	2/13/2010	
		1	RE15-10-8245	R	2/13/2010	
		1	RE15-10-8246	R	2/13/2010	
		1	RE15-10-8267	R	2/13/2010	

**SAMPLE RECEIPT & REVIEW FORM**

Client: LANL			SDG/ARCOC/Work Order: 10-1913		
Received By: Patricia Dover-Dent			Date Received: February 18, 2009		
Suspected Hazard Information		Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.	
COC/Samples marked as radioactive?			X	Maximum Counts Observed*: 60 CPM	
Classified Radioactive II by RSO?			X		
COC/Samples marked containing PCBs?			X		
Shipped as a DOT Hazardous?			X	Hazard Class Shipped: UN#:	
Samples identified as Foreign Soil?			X		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: seals broken damaged container leaking container other (describe)
2 Samples requiring cold preservation within 0 ≤ 6 deg. C?	X			Preservation Method: ice bags blue ice dry ice none other (describe) 1,2 10C
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: seals broken damaged container leaking container other (describe)
5 Samples requiring chemical preservation at proper pH?		X		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?		X		Sample ID's and containers affected:
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			Id's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?			X	Sample ID's affected: time written on containers, not on COC
11 Number of containers received match number indicated on COC?	X			Sample ID's affected:
12 COC form is properly signed in relinquished/received sections?	X			

**Comments: FEDEX#S**  
 7209 7850 1047 1C  
 7209 7850 1014 2C  
 7209 7850 1036 2C  
 7209 7850 1025 2C  
 7209 7850 0990 10C  
 7209 7850 1003 10C

PM (or PMA) review: Initials

Date

2/19/10

RIGIN ID: SAFA (505) 865-9968  
OYLENE VALDEZ  
05 ALAMOS NATL LAB  
A00 BLDG 1237 DPU 03

05 ALAMOS, NM 87545  
UNITED STATES US

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 68010AMR3A05529E00

SHIP DATE: 17FEB10  
ACTWGT: 51.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

LOS ALAMOS NATL LAB  
A00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

BILL SENDER

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 68010AMR2A0515BYDO



TRKH 7209 7850 1047

THU - 18FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

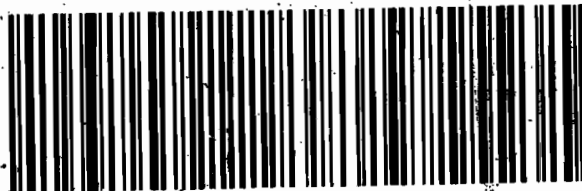


TRKH 7209 7850 1014

THU - 18FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA



LOS ALAMOS, NM 87545  
UNITED STATES US

BILL SENDER

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 68010AMR3A05529E00

OYLENE VALDEZ  
LOS ALAMOS NATL LAB  
A00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

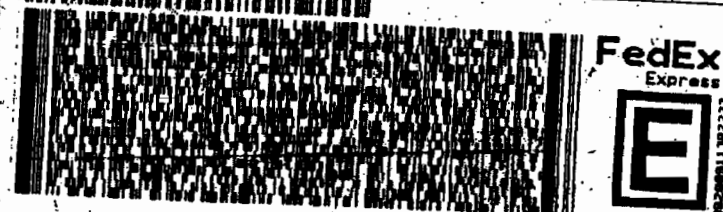
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BILL SENDER

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
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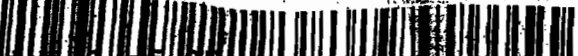


2 of 2  
PSH 7209 7850 1036

THU - 18FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA



1 of 2  
TRKH 7209 7850 1025  
HH MASTER HH

THU - 18FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA



ORIGIN ID: SAFA (505) 665-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TAGO BLDG 1237 DRU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 17FEB10  
ACTNGT: 67.0 LB MAN  
CAD: 0014176/CAFE2450  
BILL SENDER

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC, 29407  
(843) 556-8171  
REF: 68010AMR2A0515BYDO

10°



FedEx  
Express



J00200911302223

MPSH 7209 7850 0990  
0263  
MatrN 7209 7850 0989 0201

THU - 18FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

Part # 158148-434 NRIT V3 09-08



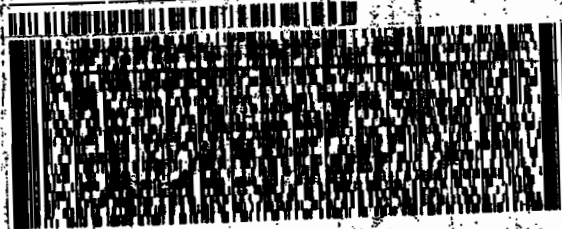
ORIGIN ID: SAFA (505) 665-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TAGO BLDG 1237 DRU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 17FEB10  
ACTNGT: 67.0 LB MAN  
CAD: 0014176/CAFE2450  
BILL SENDER

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC, 29407  
(843) 556-8171  
REF: 68010AMR2A0515BYDO

10°



FedEx  
Express



J00200911302223

MPSH 7209 7850 1003  
0263  
MatrN 7209 7850 0989 0201

THU - 18FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

Qualifier    Explanation

- \*    A quality control analyte recovery is outside of specified acceptance criteria
- \*\*   Analyte is a surrogate compound
- <    Result is less than value reported
- >    Result is greater than value reported
- ^    RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
- A    The TIC is a suspected aldol-condensation product
- B    Target analyte was detected in the associated blank
- B    Metals-Either presence of analyte detected in the associated blank, or  
MDL/IDL < sample value < PQL
- BD   Results are either below the MDC or tracer recovery is low
- C    Analyte has been confirmed by GC/MS analysis
- D    Results are reported from a diluted aliquot of the sample
- d    5-day BOD-The 2:1 depletion requirement was not met for this sample
- E    Organics-Concentration of the target analyte exceeds the instrument calibration range
- E    Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- H    Analytical holding time was exceeded
- h    Preparation or preservation holding time was exceeded
- J    Value is estimated
- N    Metals-The Matrix spike sample recovery is not within specified control limits
- N    Organics-Presumptive evidence based on mass spectral library search to make a tentative  
identification of the analyte (TIC). Quantitation is based on nearest internal standard  
response factor
- N/A   Spike recovery limits do not apply. Sample concentration exceeds spike concentration  
by 4X or more
- ND   Analyte concentration is not detected above the reporting limit
- UI   Gamma Spectroscopy-Uncertain identification
- X    Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y    QC Samples were not spiked with this compound
- Z    Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.



# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
Los Alamos National Laboratory (LANL)  
SDG 10-1913  
Work Order 247356**

**Method/Analysis Information**

**Product:** LSC, Tritium Dist, Solid  
**Analytical Method:** EPA 906.0 Modified  
**Analytical Batch Number:** 973351

<b>Sample ID</b>	<b>Client ID</b>
247356002	RE15-10-8245
247356005	RE15-10-8242
247356007	RE15-10-8241
247356008	RE15-10-8267
1202091026	Method Blank (MB)
1202091027	247356002(RE15-10-8245) Sample Duplicate (DUP)
1202091028	247356002(RE15-10-8245) Matrix Spike (MS)
1202091029	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 18.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in August 2009.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 247356002 (RE15-10-8245). The QC was from LANL work order 247356.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** H3  
**Analytical Method:** GL-RAD-A-002  
**Analytical Batch Number:** 956740

<b>Sample ID</b>	<b>Client ID</b>
247356001	RE15-10-8246
247356003	RE15-10-8243
247356004	RE15-10-8244
247356006	RE15-10-8240
1202051375	Method Blank (MB)
1202051376	247185001(RE15-10-7904) Sample Duplicate (DUP)
1202051377	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 18.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 247185001 (RE15-10-7904). The QC was from LANL work order 247185.

##### **QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Blank Decision Level**

The blank 1202051375 (MB) result is greater than the decision level but less than the MDC.

**Qualifier information**

Manual qualifiers were not required.


**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer/Date:  4/13/10

# SAMPLE DATA SUMMARY

## **GEL LABORATORIES LLC**

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### **Certificate of Analysis Report for**

LANL010 Los Alamos National Laboratory (72733-001-09)

Client SDG: 10-1913 GEL Work Order: 247356

**The Qualifiers in this report are defined as follows:**

- \* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- \*\* Indicates the analyte is a surrogate compound.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8246  
Sample ID: 247356001  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		3.22E+05	700	+/-22700	250	pCi/L		KXK2	03/03/10	1922	956740	1

### The following Analytical Methods were performed

Method	Description
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1	GL-RAD-A-002
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#### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.



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Address : PO Box 1663  
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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8246  
Sample ID: 247356001

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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h Preparation or preservation holding time was exceeded  
The above sample is reported on an "as received" basis.

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8245  
Sample ID: 247356002  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		13.1	4.49	+/-2.18	6.00	pCi/g		GXR1	04/08/10	1936	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

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- < Result is less than value reported
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- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8245  
Sample ID: 247356002

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8243  
Sample ID: 247356003  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		3.42E+06	3240	+/-2.41E+05	250	pCi/L		KXX2	03/03/10	1934	956740	1

#### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

#### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

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- A The TIC is a suspected aldol-condensation product
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- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8243  
Sample ID: 247356003

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time Batch	Mtd.
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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8244  
Sample ID: 247356004  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		7.17E+05	1030	+/-50500	250	pCi/L		KXK2	03/03/10	1936	956740	1

### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

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- F Estimated Value
- H Analytical holding time was exceeded
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- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
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- R Sample results are rejected
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- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8244  
Sample ID: 247356004

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8242  
Sample ID: 247356005  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		60.2	4.47	+/-7.33	6.00	pCi/g		GXR1	04/08/10	2039	973351	1

### **The following Analytical Methods were performed**

Method	Description
1	EPA 906.0 Modified

### **Notes:**

TPU is calculated at the 67% confidence level (1-sigma).

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded



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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8242  
Sample ID: 247356005

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time Batch	Mtd.
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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8240  
Sample ID: 247356006  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>H3 "As Received"</i>												
Tritium		3.62E+05	805	+/-25500	250	pCi/L		KXK2	03/03/10	1942	956740	1

### The following Analytical Methods were performed

Method	Description
1	GL-RAD-A-002

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

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- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8240  
Sample ID: 247356006

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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The above sample is reported on an "as received" basis.

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8241  
Sample ID: 247356007  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		50.7	4.38	+/-6.24	6.00	pCi/g		GXR1	04/08/10	2141	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

#### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

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- < Result is less than value reported
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- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8241  
Sample ID: 247356007

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8267  
Sample ID: 247356008  
Matrix: R  
Collect Date: 13-FEB-10  
Receive Date: 18-FEB-10  
Collector: Client

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
<b>Rad Liquid Scintillation Analysis</b>												
<i>LSC, Tritium Dist, Solid "As Received"</i>												
Tritium		64.1	4.49	+/-7.79	6.00	pCi/g		GXR1	04/08/10	2244	973351	1

### The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

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- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

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### Certificate of Analysis

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: April 13, 2010

Client Sample ID: RE15-10-8267  
Sample ID: 247356008

Project: LANL01004  
Client ID: LANL010

Parameter	Qualifier	Result	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
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The above sample is reported on an "as received" basis.

# QUALITY CONTROL DATA



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## QC Summary

Report Date: April 13, 2010

Page 1 of 2

Client : Los Alamos National Laboratory  
PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico  
Contact: Ms. Joylene Valdez  
Workorder: 247356

Parmname	NOM	Sample Qual	QC	Units	RER	REC %	Range	Anlst	Date Time
Rad Liquid Scintillation									
Batch	956740								
QC1202051376	247185001	DUP							
Tritium		216	239	pCi/L	0.0896		(0-1)	KXK2	03/03/1021:34
		TPU: +/-64.8	+/-65.9						
QC1202051377	LCS								
Tritium	5550		6060	pCi/L		109	(80%-120%)		03/04/1000:21
		TPU:	+/-538						
QC1202051375	MB								
Tritium		U	139	pCi/L					03/03/1019:56
		TPU:	+/-61.9						
Batch	973351								
QC1202091027	247356002	DUP							
Tritium		13.1	9.21	pCi/g	0.476		(0-1)	GXR1	04/09/1000:49
		TPU: +/-2.18	+/-1.89						
QC1202091029	LCS								
Tritium	32.0		33.7	pCi/g		105	(80%-120%)		04/09/1002:05
		TPU:	+/-5.17						
QC1202091026	MB								
Tritium		U	-0.495	pCi/g					04/08/1023:46
		TPU:	+/-1.24						
QC1202091028	247356002	MS							
Tritium	34.1	13.1	41.9	pCi/g		84.5	(75%-125%)		04/09/1001:49
		TPU: +/-2.18	+/-6.16						

### Notes:

The Qualifiers in this report are defined as follows:

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- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit

## GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### QC Summary

Workorder: 247356

Page 2 of 2

Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
R	Sample results are rejected									
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.									
UI	Gamma Spectroscopy--Uncertain identification									
UJ	Gamma Spectroscopy--Uncertain identification									
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier									
Y	QC Samples were not spiked with this compound									
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.									
h	Preparation or preservation holding time was exceeded									

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

\*\* Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

**RAW DATA**

# Radiochemistry Batch Checklist, Rev10

Batch# 956740

Product: H<sub>3</sub>

Date: 3-4-10

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			NA
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD.	✓		
(If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All line outs initialed and dated.			
No transcription errors are apparent.			
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

RADchecklistrev10, revised 1/13/2010

Primary Review Performed By: [Signature]

Secondary Review Performed By: [Signature]

LANL 3-11-10

# Tritium Que Sheet

01-MAR-10

Batch #: 956740

Analyst: KXK2

First Client Due Date 11-MAR-10

Spike Isotope: Hydrogen-3

Spike Code: 0134-K

Expiration Date: 3/27/10

Vol: 0.1

LCS Isotope: Hydrogen-3

LCS Code: 0134-K

Expiration Date: 3/27/10

Vol: 0.1

Prep Date: 2/25/10 Initials: YJ Pipet ID: 2910968 Witness: HS 3-1-10

Sample ID	Client Samp ID	Type	Hazard Code	Min CRDL	Matrix	Client	Sample Date	Aliquot in vial (g/mL)	LSC Rack #	Dist Rtg #	Vol added for Dist (mL)	Initial Sample Aliquot (g/mL)	Final Wt (g)	Total Moisture Vol (mL)
247185001-1	RE15-10-7904	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-2	1		397.77	356.00	41.77
247185002-1	RE15-10-7903	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-3	2		302.64	243.93	58.71
247185003-1	RE15-10-7994	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-4	3		445.60	396.14	49.46
247185004-1	RE15-10-7997	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-5	4		413.03	318.03	95.00
247185005-1	RE15-10-7998	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-6	5		474.97	439.90	65.07
247185006-1	RE15-10-8000	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-7	6		402.60	353.48	49.12
247185007-1	RE15-10-7999	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	25-8	7		412.20	339.45	72.55
247185008-1	RE15-10-7995	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	57-1	8		357.07	245.30	91.77
247185009-1	RE15-10-7996	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	57-2	9		438.64	428.54	60.10
247185010-1	RE15-10-7993	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	57-3	10		310.76	247.18	61.52
247185011-1	RE15-10-8064	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	10-FEB-10	10	57-4	11		311.61	220.93	90.68
247327002-1	WST15-10-8941	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	16-FEB-10	10	57-5	12		537.45	495.53	41.92
247356001-1	RE15-10-8246	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10	7	57-6	13		571.66	563.09	8.57
247356002-1	RE15-10-8245	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10			14				
247356003-1	RE15-10-8243	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10	5	57-7	15		500.17	492.67	7.50
247356004-1	RE15-10-8244	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10	8	57-8	16		519.91	508.47	11.44
247356005-1	RE15-10-8242	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10			17				
247356006-1	RE15-10-8240	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10	6	57-9	18		587.87	578.46	9.41
247356007-1	RE15-10-8241	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10			19				
247356008-1	RE15-10-8267	SAMPLE		.25 pCi/mL SOIL	LANL010	LANL010	13-FEB-10			20				
1202051375-1	MB for batch 956740	MB		.25 pCi/mL SOIL	QC ACCOUNT	QC ACCOUNT		10	57-10	21		20.00	0	20.00
1202051376-1	RE15-10-7904(247185001DUP)	DUP		.25 pCi/mL SOIL	QC ACCOUNT	QC ACCOUNT	10-FEB-10	10	57-11	1		397.77	356.00	41.77
1202051377-1	LCS for batch 956740	LCS		.25 pCi/mL SOIL	QC ACCOUNT	QC ACCOUNT		10	39-1	22		20.00	0	20.00

Bkg Rack #: 25-1

daillies ✓

Bkg prepared with dead water? ☒ Yes ☐ No

Comments:

Instrument Used (circle as appropriate): LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500

(Gold) 7070506, LS6500 (Green) 7067404, Wallace (Yellow) 4140127, LS6000 (Brown) 7060655, Wallace

(Pink) 220082, Wallace (White) 4140299, Purple 7060656, Orange DG06095168

Calibration Used: Ecosci Ultra (10 mL sample/13 mL Ecosci Ultra)

Data Reviewed By: W 3-4-10

GEL Laboratories LLC, Radiochemistry Division

Page 1 of 1

DATE	2/25/2010	INITIALS	KXK2	BATCH NUMBER	956740				
Sample #	Flask Wt. (g)	Sample Wet (g)	Flask & Sample Wet (g)	% Moisture of Sample (Balance Interface using % Moisture Batch)	Total Moisture in Sample (mL)	Sample Dry (g)	Flask & Sample Dry (g)	mLs aliquoted into LSC vial	Collection Tube Number
247185001	200	397.77	597.77	0.105	41.77	356.00	556.00	10	
247185002	200	302.64	502.64	0.194	58.71	243.93	443.93	10	
247185003	200	445.60	645.60	0.111	49.46	396.14	596.14	10	
247185004	200	413.03	613.03	0.230	95.00	318.03	518.03	10	
247185005	200	474.97	674.97	0.137	65.07	409.90	609.90	10	
247185006	200	402.60	602.60	0.122	49.12	353.48	553.48	10	
247185007	200	412.20	612.20	0.176	72.55	339.65	539.65	10	
247185008	200	357.07	557.07	0.257	91.77	265.30	465.30	10	
247185009	200	488.64	688.64	0.123	60.10	428.54	628.54	10	
247185010	200	310.70	510.70	0.198	61.52	249.18	449.18	10	
247185011	200	311.61	511.61	0.291	90.68	220.93	420.93	10	
247327002	200	537.45	737.45	0.078	41.92	495.53	695.53	10	
247356001	200	571.66	771.66	0.015	8.57	563.09	763.09	10	
247356002	200	500.17	700.17	0.015	7.50	492.67	692.67	10	
247356003	200	519.91	719.91	0.022	11.44	508.47	708.47	10	
247356004	200	587.87	787.87	0.016	9.41	578.46	778.46	10	
247356005	200	587.87	787.87	0.011	8.57	563.09	763.09	10	
247356006	200	587.87	787.87	0.011	8.57	563.09	763.09	10	
247356007	200	587.87	787.87	0.011	8.57	563.09	763.09	10	
247356008	200	587.87	787.87	0.011	8.57	563.09	763.09	10	
MB	200	20.00	220.00	1.000	20.00	0.00	200.00	10	
DUP	200	397.77	597.77	0.105	41.77	356.00	556.00	10	
LCS	200	20.00	220.00	1.000	20.00	0.00	200.00	10	

3-4-10

3-4-10

3-4-10

3-4-10

## Tritium Solid

Filename : HSVAC.XLS  
File type : Excel  
Version # : 1.2.6

Batch : 956740  
Analyst : KXK2  
Prep Date : 2/25/2010

Spike S/N :  
Spike Exp Date :  
Spike Activity (dpm/ml):  
Spike Volume Added:

LCS S/N : 0134-K  
LCS Exp Date : 3/27/2010  
LCS Activity (dpm/ml): 2462.88  
LCS Volume Added: 0.10

Procedure Code : LSC\_VH3S  
Param Name : Tritium  
Required MDC : 250 pCi/L  
Half-life of Tritium : 12.32 years

H-3 Abundance : 1  
Method Uncertainty : 0.0691  
Geometry: 10mL DW/13mL  
Eosocint Ultra

Sample Characteristics		Wet Sample Weight (g)	Total Moisture L	Sample Aliquot in Vial L	Sample Aliquot Stdev. L	Dry Sample Weight (g)	% Moisture of Sample	Rig number	Sample Date/Time
Pos.	Sample ID								
1	247185001.1	397.77	0.0418	0.0100	2.5728E-05	356.00	10.50%	1	2/10/2010 12:00
2	247185002.1	302.64	0.0587	0.0100	2.5728E-05	243.93	19.40%	2	2/10/2010 12:00
3	247185003.1	445.60	0.0485	0.0100	2.5728E-05	396.14	11.10%	3	2/10/2010 12:00
4	247185004.1	413.03	0.0950	0.0100	2.5728E-05	318.03	23.00%	4	2/10/2010 12:00
5	247185005.1	474.97	0.0651	0.0100	2.5728E-05	408.90	13.70%	5	2/10/2010 12:00
6	247185006.1	402.60	0.0491	0.0100	2.5728E-05	353.48	12.20%	6	2/10/2010 12:00
7	247185007.1	412.20	0.0726	0.0100	2.5728E-05	339.65	17.80%	7	2/10/2010 12:00
8	247185008.1	357.07	0.0918	0.0100	2.5728E-05	285.30	25.70%	8	2/10/2010 12:00
9	247185009.1	488.64	0.0601	0.0100	2.5728E-05	428.54	12.30%	9	2/10/2010 12:00
10	247185010.1	310.70	0.0615	0.0100	2.5728E-05	249.18	19.80%	10	2/10/2010 12:00
11	247185011.1	311.61	0.0907	0.0100	2.5728E-05	220.93	29.10%	11	2/10/2010 12:00
12	247327002.1	537.45	0.0419	0.0100	2.5728E-05	495.53	7.80%	12	2/16/2010 12:00
13	247356001.1	571.68	0.0086	0.0070	2.5728E-05	563.09	1.50%	13	2/13/2010 12:00
14	247366002.1	600.17	0.0096	0.0400	2.5728E-05	492.67	1.60%	14	2/13/2010 12:00
15	247356003.1	500.17	0.0075	0.0050	2.5728E-05	482.67	1.50%	15	2/13/2010 12:00
16	247356004.1	519.91	0.0114	0.0080	2.5728E-05	508.47	2.20%	16	2/13/2010 12:00
17	247366005.1	20.00	0.0094	0.0400	2.5728E-05	679.46	-3792.96%	17	2/13/2010 12:00
18	247356006.1	587.87	0.0084	0.0060	2.5728E-05	578.46	1.80%	18	2/13/2010 12:00
19	247366007.1	20.00	0.0094	0.0400	2.5728E-05	0.00	100.00%	19	2/13/2010 12:00
20	247366008.1	20.00	0.0200	0.0400	2.5728E-05	0.00	100.00%	20	2/13/2010 12:00
21	1202051375.1	20.00	0.0200	0.0100	2.5728E-05	0.00	100.00%	21	2/25/2010 0:00
22	1202051376.1	387.77	0.0418	0.0100	2.5728E-05	356.00	10.50%	1	2/10/2010 12:00
23	1202051377.1	20.00	0.0200	0.0100	2.5728E-05	0.00	100.00%	22	2/25/2010 0:00

Count raw Data			Counting		Background		Calibration Data		Detector Efficiency		Backgrounds				
Pos.	Rack Position #	Time (min.)	Quench#	Gross cpm	Count Time (min.)	Count Start Date/Time	Sample Decay	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Rack Position #	Count Start Date/Time	
1	25-2	95	117.9	3.57	95	3/2/2010 18:14	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1841	0.00792	25-1	3/2/2010 16:36	
2	25-3	95	118.3	5.13	95	3/2/2010 19:53	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1838	0.00792	25-1	3/2/2010 16:36	
3	25-4	95	116.8	3.27	95	3/2/2010 21:31	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1850	0.00792	25-1	3/2/2010 16:36	
4	25-5	95	118.8	4.8	95	3/2/2010 23:09	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1836	0.00792	25-1	3/2/2010 16:36	
5	25-6	95	118.1	4.27	95	3/3/2010 0:47	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1840	0.00792	25-1	3/2/2010 16:36	
6	25-7	95	118.4	3.33	95	3/3/2010 2:25	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1838	0.00792	25-1	3/2/2010 16:36	
7	25-8	95	118.3	4.15	95	3/3/2010 4:03	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1835	0.00792	25-1	3/2/2010 16:36	
8	57-1	95	118.7	5.16	95	3/3/2010 11:14	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36	
9	57-2	95	118.5	5.35	95	3/3/2010 12:52	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1833	0.00792	25-1	3/2/2010 16:36	
10	57-3	95	119	4.28	95	3/3/2010 14:30	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1835	0.00792	25-1	3/2/2010 16:36	
11	57-4	95	118.7	9.07	95	3/3/2010 16:08	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1848	0.00792	25-1	3/2/2010 16:36	
12	57-5	95	118.5	3.24	95	3/3/2010 17:48	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36	
13	57-6	10.85	117	925.16	95	3/3/2010 19:22	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36	
14	67-2	1.46	448.6	6949.65	96	3/3/2010 19:34	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36	
15	57-7	1.45	118.5	6949.65	2.69	95	3/3/2010 19:34	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36
16	57-8	4.3	117.8	2342.09	2.69	95	3/3/2010 19:36	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1842	0.00792	25-1	3/2/2010 16:36
17	67-4	96	447.4	3.26	2.69	96	3/3/2010 19:56	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36
18	57-9	11.3	118.5	885.93	2.69	95	3/3/2010 19:42	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1837	0.00792	25-1	3/2/2010 16:36
19	30-1	16	447.6	27.47	2.69	96	3/4/2010 0:21	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1844	0.00792	25-1	3/2/2010 16:36
20	30-1	16	447.6	27.47	2.69	96	3/4/2010 0:21	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1844	0.00792	25-1	3/2/2010 16:36
21	57-10	95	117.4	3.26	2.69	95	3/3/2010 19:56	0.999	LSCGREEN	8/20/2009	8/31/2010	0.1845	0.00792	25-1	3/2/2010 16:36
22	57-11	95	119.2	3.66	2.69	95	3/3/2010 21:34	0.997	LSCGREEN	8/20/2009	8/31/2010	0.1832	0.00792	25-1	3/2/2010 16:36
23	30-1	15	117.5	27.47	2.69	95	3/4/2010 0:21	0.999	LSCGREEN	8/20/2009	8/31/2010	0.1844	0.00792	25-1	3/2/2010 16:36



## Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Results		Decision Level	Critical Level	Required MDC	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	1 SIGMA Counting Uncertainty	1 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCIVL	Recovery
Pos.	pCIVL	pCIVL	pCIVL	pCIVL	pCIVL	pCIVL	CPM	CPM	pCIVL	pCIVL						
1	136.0805	96.0599	250	199.8698	215.9383	0.292	0.880	0.257	82.9801	64.7606		SAMPLE				
2	136.2846	96.2181	250	200.1980	599.7240	0.118	2.440	0.287	70.5185	81.9606		SAMPLE				
3	135.4891	95.6424	250	199.0000	141.7043	0.432	0.580	0.250	61.1951	61.9858		SAMPLE				
4	136.4568	96.3397	250	200.4509	519.2690	0.133	2.110	0.281	69.1017	77.9837		SAMPLE				
5	136.1771	96.1422	250	200.0401	388.0396	0.172	1.580	0.271	66.4755	71.7593		SAMPLE				
6	136.3466	96.2619	250	200.2890	157.3762	0.383	0.640	0.252	61.9007	62.8636		SAMPLE				
7	136.2918	96.2232	250	200.2085	358.8701	0.184	1.460	0.268	65.9554	70.5326		SAMPLE				
8	136.5243	96.3873	250	200.5500	608.1651	0.117	2.470	0.287	70.7779	82.4842		SAMPLE				
9	136.4122	96.3082	250	200.3953	654.4083	0.110	2.660	0.281	71.5705	84.8510		SAMPLE				
10	136.6991	96.5107	250	200.8068	387.0615	0.172	1.570	0.270	68.6824	71.9254		SAMPLE				
11	136.5286	96.3903	250	200.5563	1570.9375	0.056	6.360	0.352	86.6324	139.5569		SAMPLE				
12	136.2904	96.2222	250	200.2065	135.1894	0.454	0.550	0.250	61.4109	62.1285		SAMPLE				
13	427.6181	301.9020	250	700.3528	322112.4425	0.014	922.470	9.236	3224.9345	22696.4569		SAMPLE				
14	786.3692	566.1784	250	1419.1408	1708364.1998	0.013	6946.960	69.291	17024.8138	149194.6998		SAMPLE				
15	1572.7185	1110.3528	250	3238.2815	3416712.3996	0.015	8946.960	89.231	34049.6276	241351.6984		SAMPLE				
16	577.5100	407.7270	250	1029.3003	717056.4685	0.014	2339.400	23.339	7153.6504	50488.8831		SAMPLE				
17	482.8680	347.9691	250	804.7499	362002.6128	0.014	883.240	8.856	3629.7095	25532.9887		SAMPLE				
18	260.0454	183.5043	250	418.1730	6060.1729	0.066	24.790	1.364	333.0079	638.7321		SAMPLE				
19	260.0454	183.5043	250	418.1730	6060.1729	0.066	24.790	1.364	333.0079	638.7321		SAMPLE				
20	135.5085	95.6688	250	199.0550	138.2998	0.439	0.570	0.250	61.1808	61.9253		SAMPLE				
21	136.8210	96.5968	250	200.9859	239.3632	0.287	0.970	0.259	63.7959	65.9390		SAMPLE				
22	259.5852	183.2683	250	415.4364	6058.4311	0.056	24.780	1.364	333.4087	537.7786		SAMPLE				
23											247185001.1	MB	10.3%	0.0896	5547.0370	109.2%
											LCS					

## ID: TRITIUM

2 MAR 2010 16:40

USER: 2 COMMENT: GREEN  
 PRESET TIME : 95.00  
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD  
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT  
 TWO PHASE : NO ADC : NO CYCLE REPEATS : 1 DISK : OFF  
 SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF  
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 10.0 - 230.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0  
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	25-1	95.00	116.9	2.69	13.24	34.69	3.50	0.80	97.68
2	25-2	95.00	117.9	3.57	11.35	34.93	3.49	0.77	195.84
3	25-3	95.00	118.3	5.13	9.34	37.38	3.37	0.73	294.01
4	25-4	95.00	116.8	3.27	11.84	34.56	3.51	0.74	392.14
5	25-5	95.00	118.6	4.80	9.62	38.39	3.32	0.63	490.27
6	25-6	95.00	118.1	4.27	10.23	36.12	3.43	0.64	588.37
7	25-7	95.00	118.4	3.33	11.65	34.60	3.50	0.61	686.47
8	25-8	95.00	118.3	4.15	10.34	36.03	3.43	0.54	784.54

INSTRUMENT CALIBRATION: Mini 3 MAR 2010 05:48  
 Calibration successful

PAGE: 1

ID: TRITIUM

3 MAR 2010 11:17

USER: 2 COMMENT: GREEN  
 PRESET TIME : 95.00  
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD  
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT  
 TWO PHASE : NO AGC : NO CYCLE REPEATS : 1 DISK : OFF  
 SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF  
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 10.0 - 230.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0  
 CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	57-1	95.00	118.7	5.16	9.70	38.78	3.33	1.67	97.91
2	57-2	95.00	118.5	5.35	9.11	36.91	3.39	0.70	196.06
3	57-3	95.00	119.0	4.26	10.17	35.06	3.48	0.51	294.12
4	57-4	95.00	118.7	9.07	6.88	42.55	3.15	0.42	392.17
5	57-5	95.00	118.5	3.24	11.72	33.69	3.54	0.51	490.22
6	57-6	10.85	117.0	925.16	2.00	1318.80	1.67	0.02	502.27
7	57-7	1.45	118.5	6949.65	1.99	9614.48	1.69	0.01	504.71
8	57-8	4.30	117.8	2342.09	1.99	3287.91	1.68	0.01	509.99
9	57-9	11.30	118.5	885.93	2.00	1261.77	1.68	0.02	522.48
10	57-10	95.00	117.4	3.26	11.65	33.45	3.56	0.48	620.53
11	57-11	95.00	119.2	3.66	11.01	35.09	3.47	0.52	718.61

INSTRUMENT CALIBRATION: Mini 3 MAR 2010 23:19  
 Calibration successful

PAGE: 1

ID: TRITIUM

4 MAR 2010 00:27

USER: 4 COMMENT: GREEN

PRESET TIME : 15.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

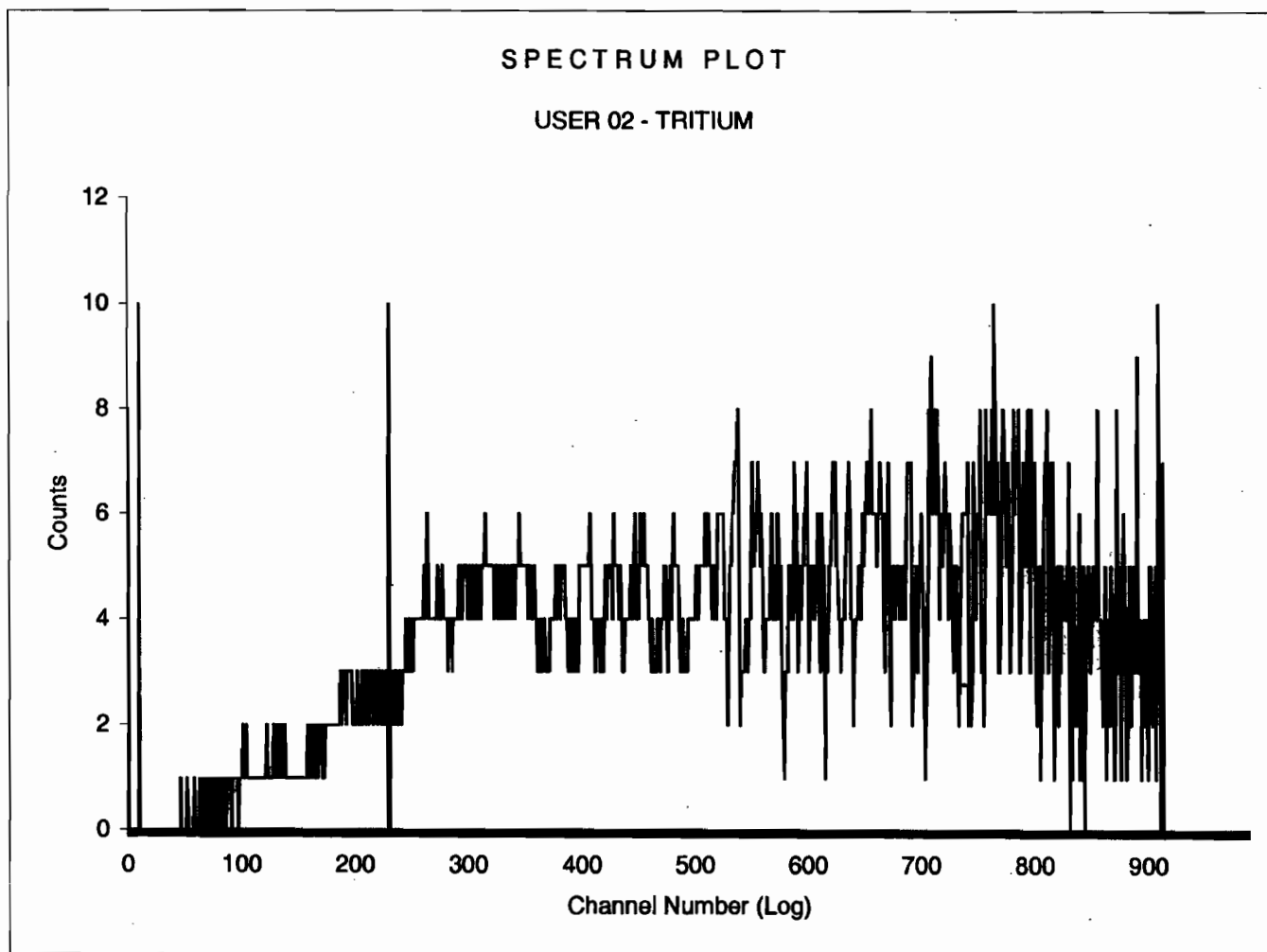
CHAN: 10.0 - 230.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

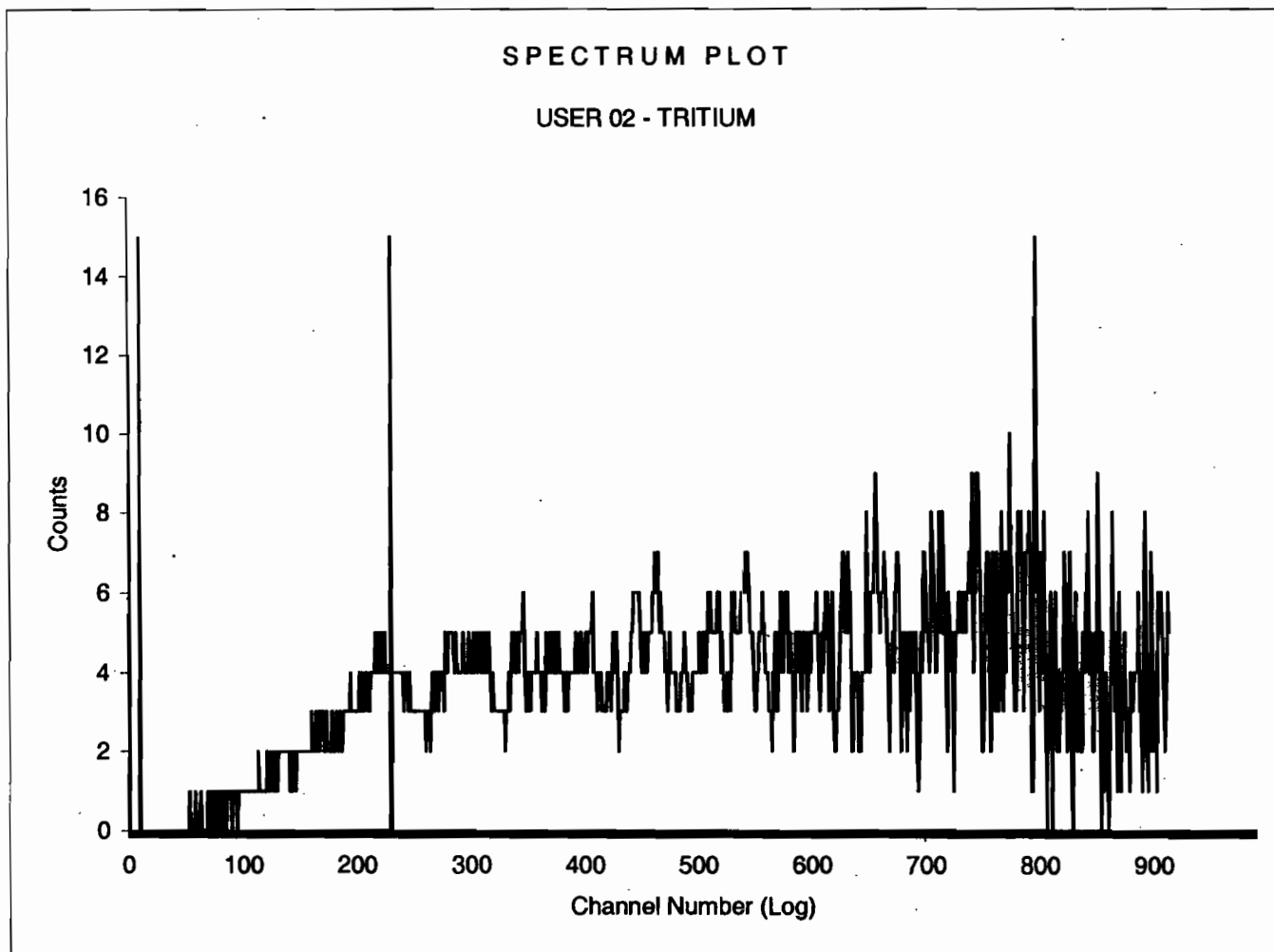
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	39-1	15.00	117.5	27.47	9.88	66.87	6.32	0.32	15.80

Sample Count Start Time:	2 Mar 2010 16:36:43
Data Capture Date	02 Mar 2010 18:11:08
User Filename	S02030225-1A.XLS
	U02030225-1A.XLS
Spectrum Type	Log Counts
User Number	02
User Id	TRITIUM
User Comment	GREEN
Scintillator	LIQUID
Sample, Rack-Pos, Time:	1 25-1 95.00
H#, Total Counts:	116.9 3351
Win1: Tritium - Start, End, Counts:	10 230 259
Win2: - Start, End, Counts:	0 990 3351



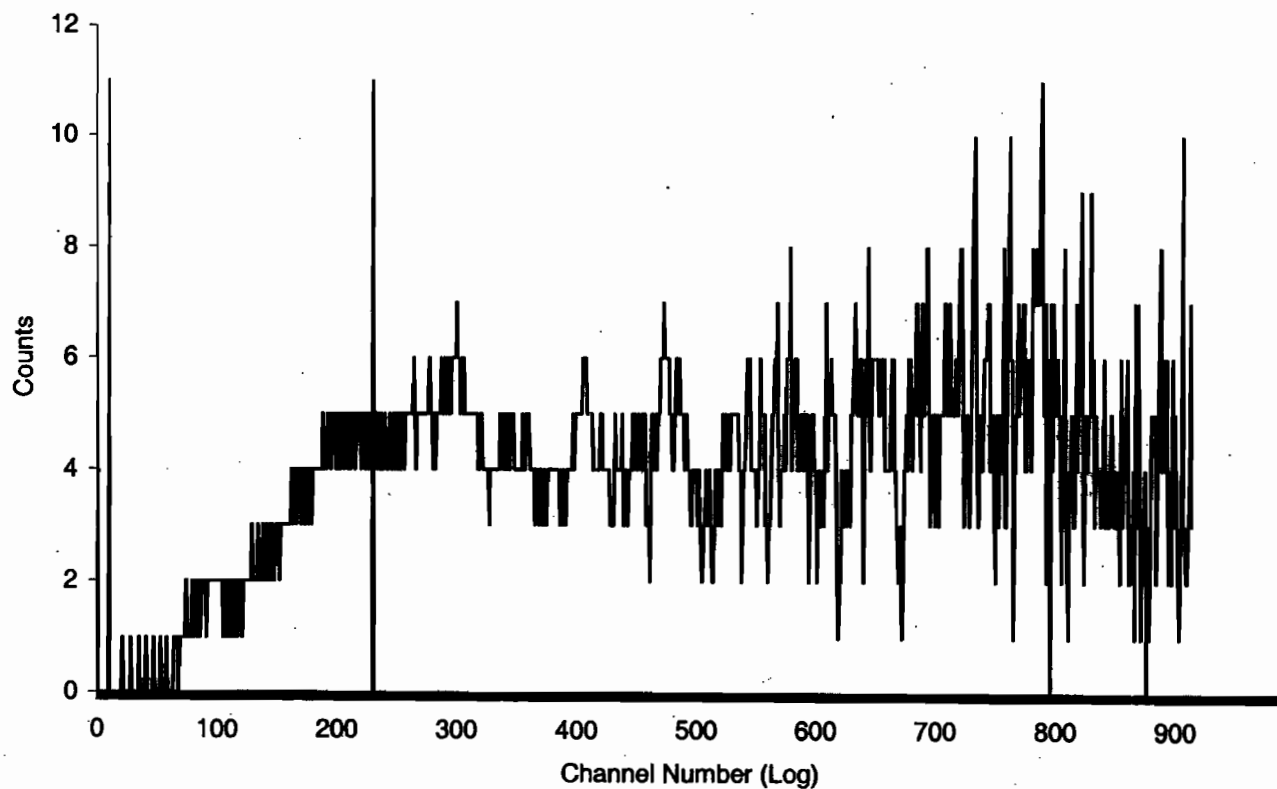
Sample Count Start Time:	2 Mar 2010 18:14:52		
Data Capture Date	02 Mar 2010 19:49:18		
User Filename	S02030225-2A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	25-2	95.00
H#, Total Counts:	117.9	3378	
Win1: Tritium - Start, End, Counts:	10	230	343
Win2: - Start, End, Counts:	0	990	3378



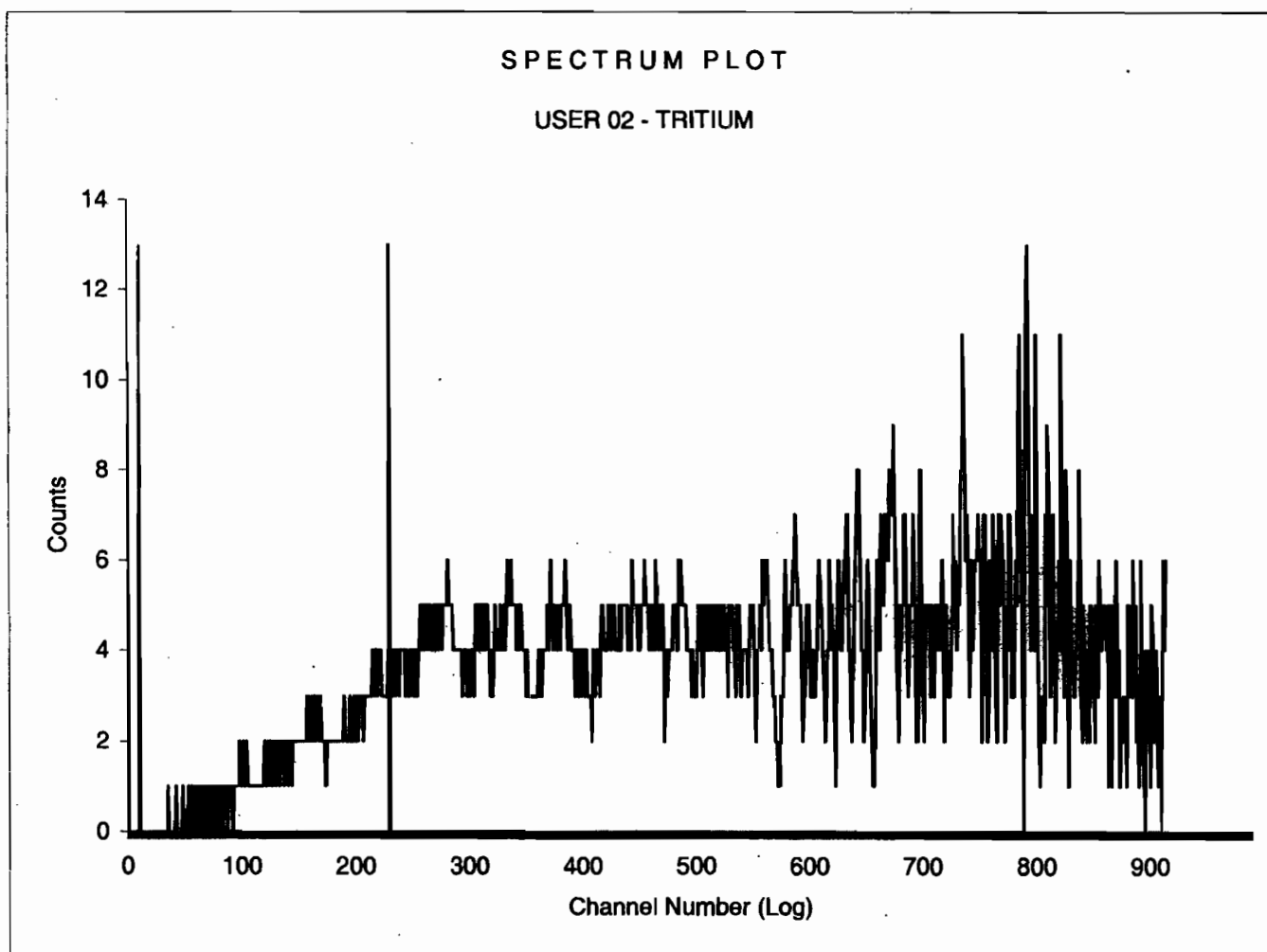
Sample Count Start Time:	2 Mar 2010 19:53:03		
Data Capture Date	02 Mar 2010 21:27:27		
User Filename	S02030225-3A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	25-3	95.00
H#, Total Counts:	118.3	3600	
Win1: Tritium - Start, End, Counts:	10	230	491
Win2: - Start, End, Counts:	0	990	3600

# SPECTRUM PLOT

USER 02 - TRITIUM



Sample Count Start Time:	2 Mar 2010 21:31:10		
Data Capture Date	02 Mar 2010 23:05:36		
User Filename	S02030225-4A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	25-4	95.00
H#, Total Counts:	116.8	3330	
Win1: Tritium - Start, End, Counts:	10	230	314
Win2: - Start, End, Counts:	0	990	3329

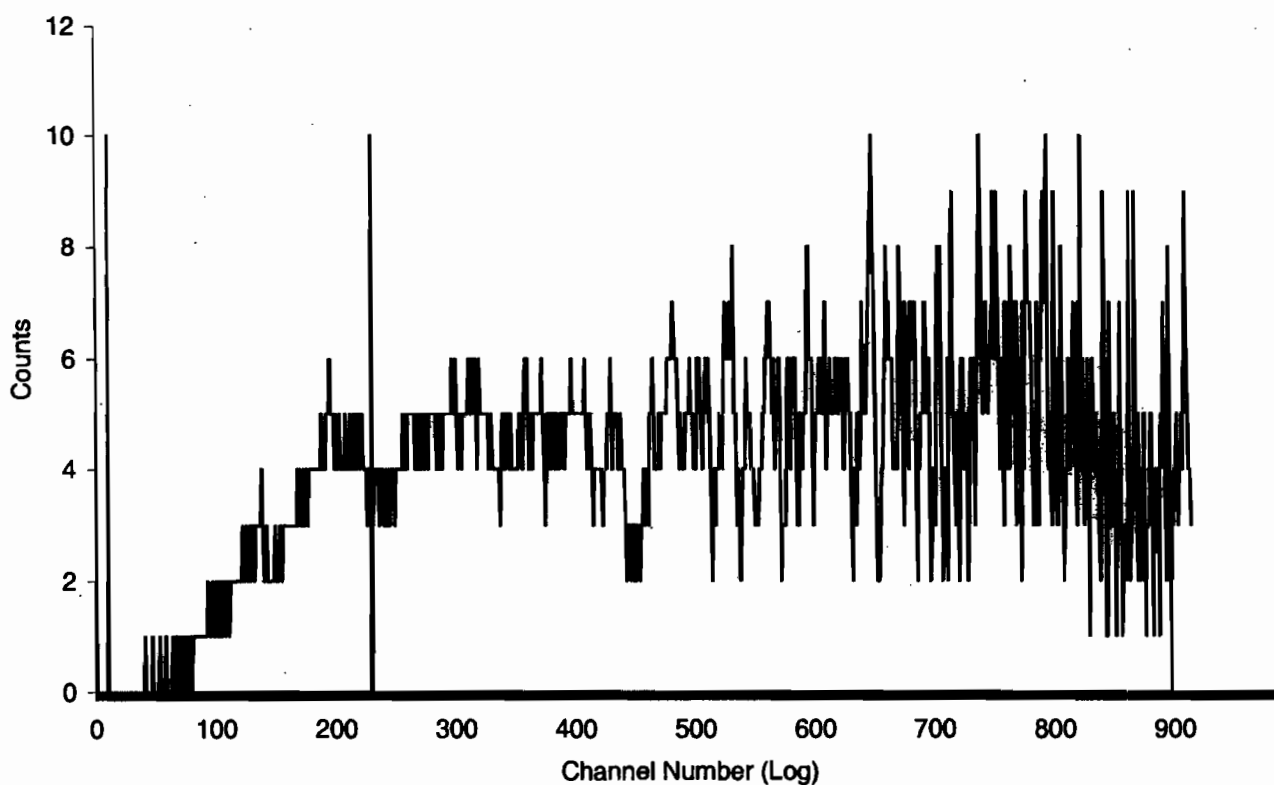




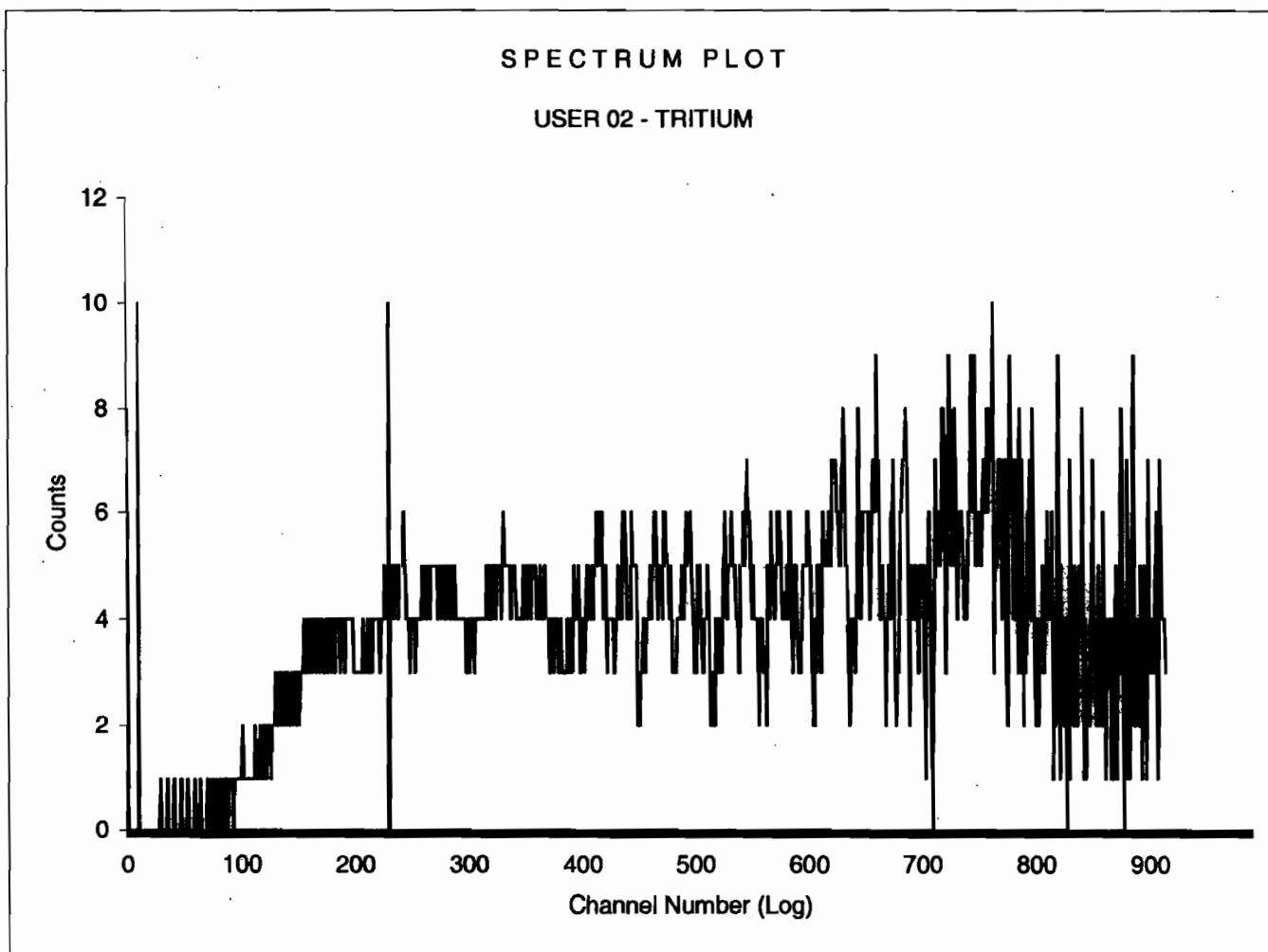
Sample Count Start Time:	2 Mar 2010 23:09:18		
Data Capture Date	03 Mar 2010 00:43:44		
User Filename	S02030325-5A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	25-5	95.00
H#, Total Counts:	118.6	3714	
Win1: Tritium - Start, End, Counts:	10	230	459
Win2: - Start, End, Counts:	0	990	3713

# SPECTRUM PLOT

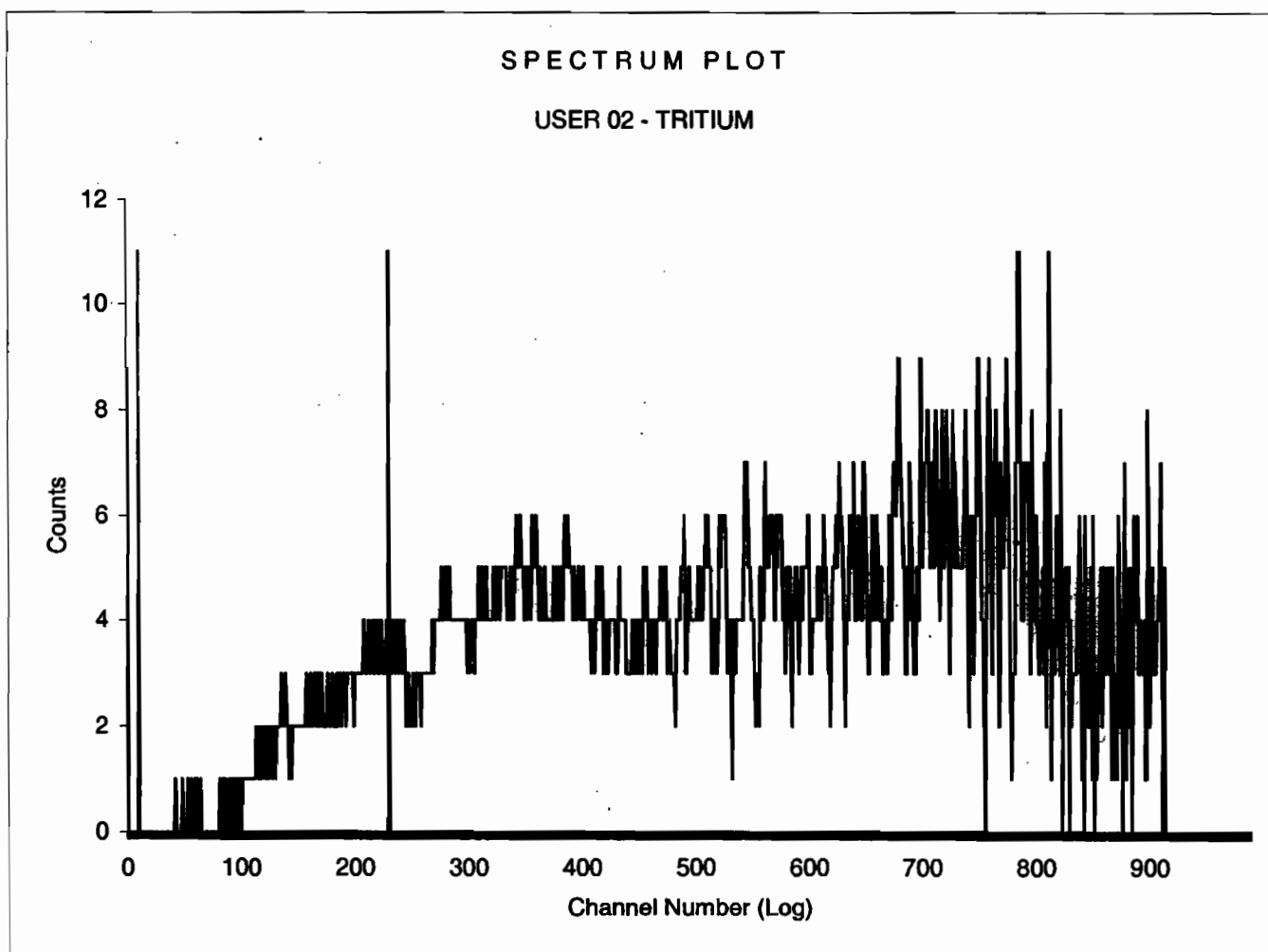
USER 02 - TRITIUM



Sample Count Start Time:	3 Mar 2010 00:47:24		
Data Capture Date	03 Mar 2010 02:21:51		
User Filename	S02030325-6A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	25-6	95.00
H#, Total Counts:	118.1	3487	
Win1: Tritium - Start, End, Counts:	10	230	410
Win2: - Start, End, Counts:	0	990	3486



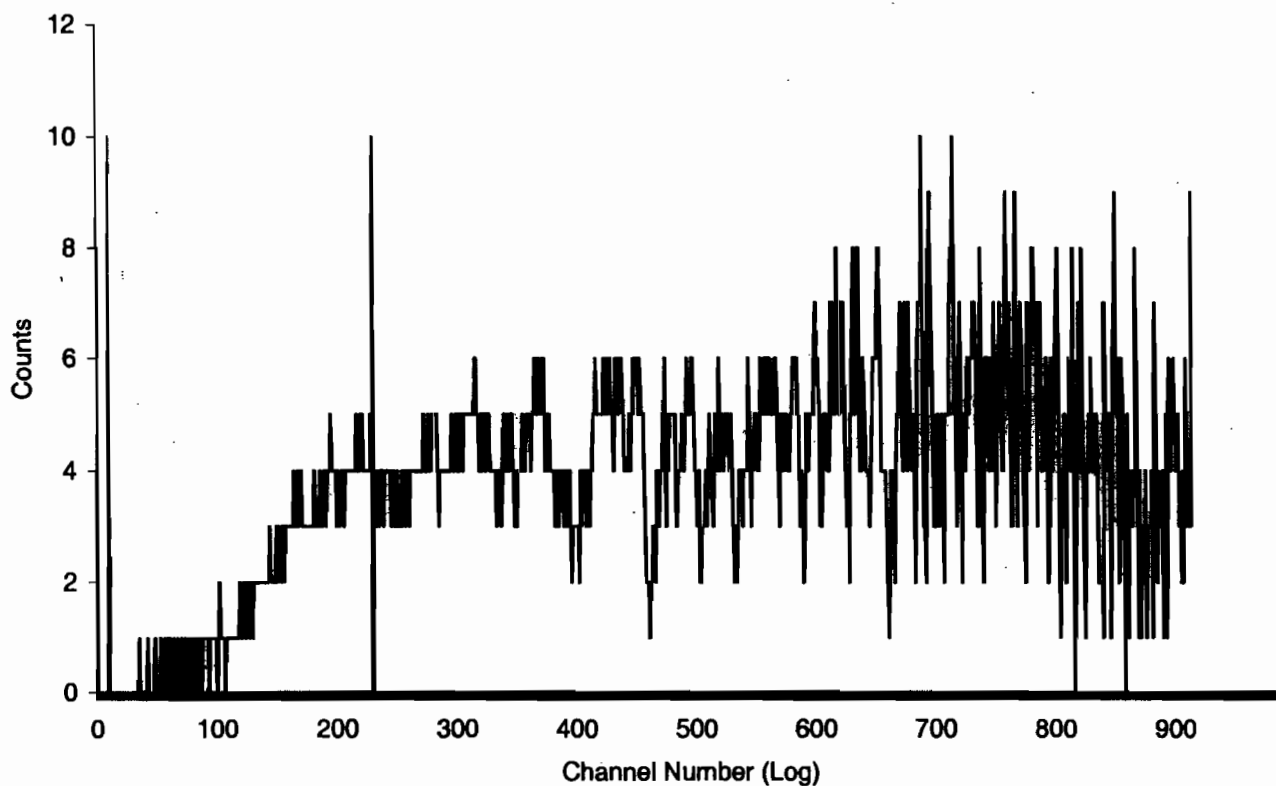
Sample Count Start Time:	3 Mar 2010 02:25:30		
Data Capture Date	03 Mar 2010 03:59:56		
User Filename	S02030325-7A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	25-7	95.00
H#, Total Counts:	118.4	3339	
Win1: Tritium - Start, End, Counts:	10	230	319
Win2: - Start, End, Counts:	0	990	3339



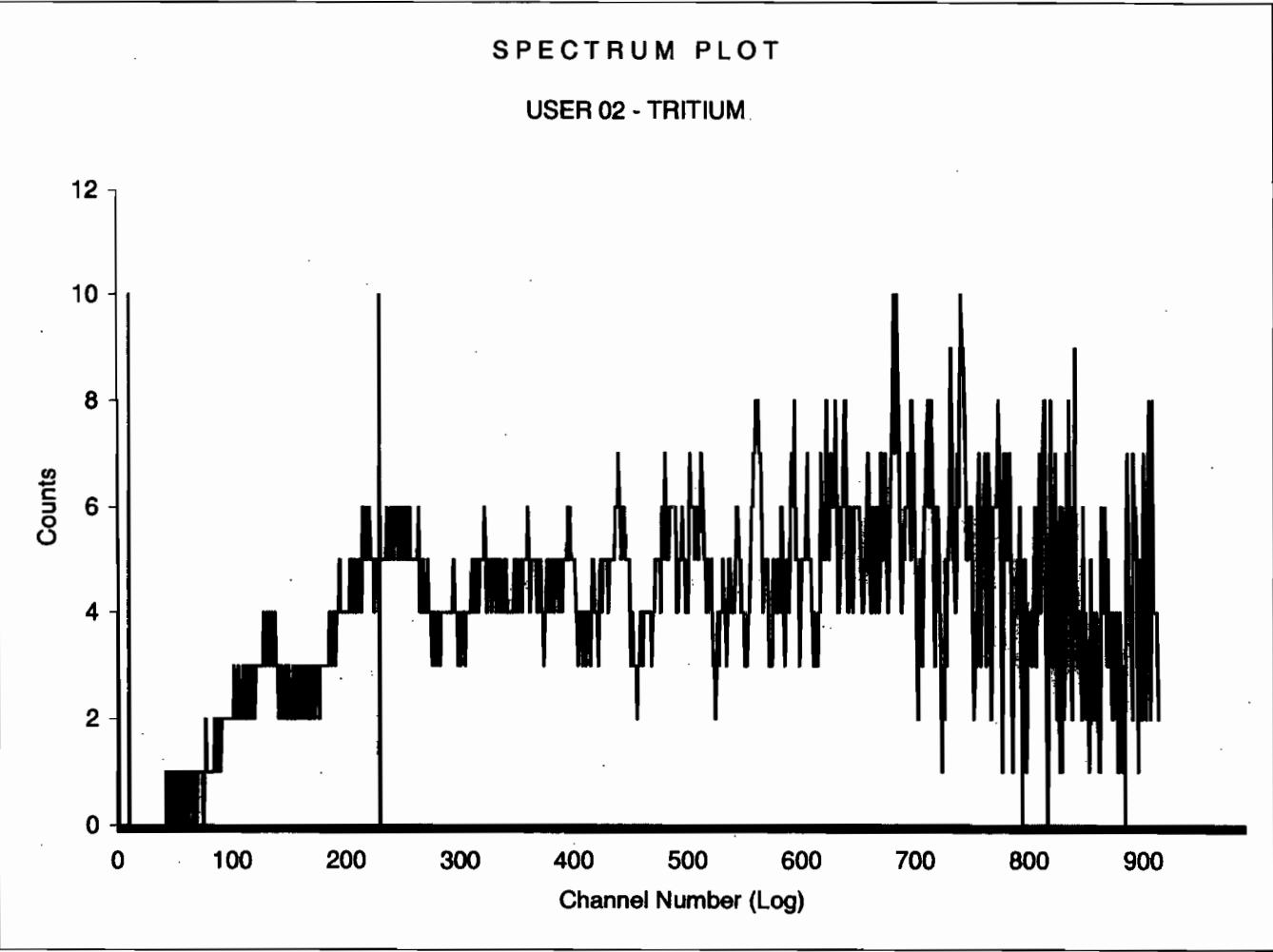
Sample Count Start Time:	3 Mar 2010 04:03:34		
Data Capture Date	03 Mar 2010 05:38:01		
User Filename	S02030325-8A.XLS		
	U02030225-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	25-8	95.00
H#, Total Counts:	118.3	3479	
Win1: Tritium - Start, End, Counts:	10	230	398
Win2: - Start, End, Counts:	0	990	3479

# SPECTRUM PLOT

USER 02 - TRITIUM



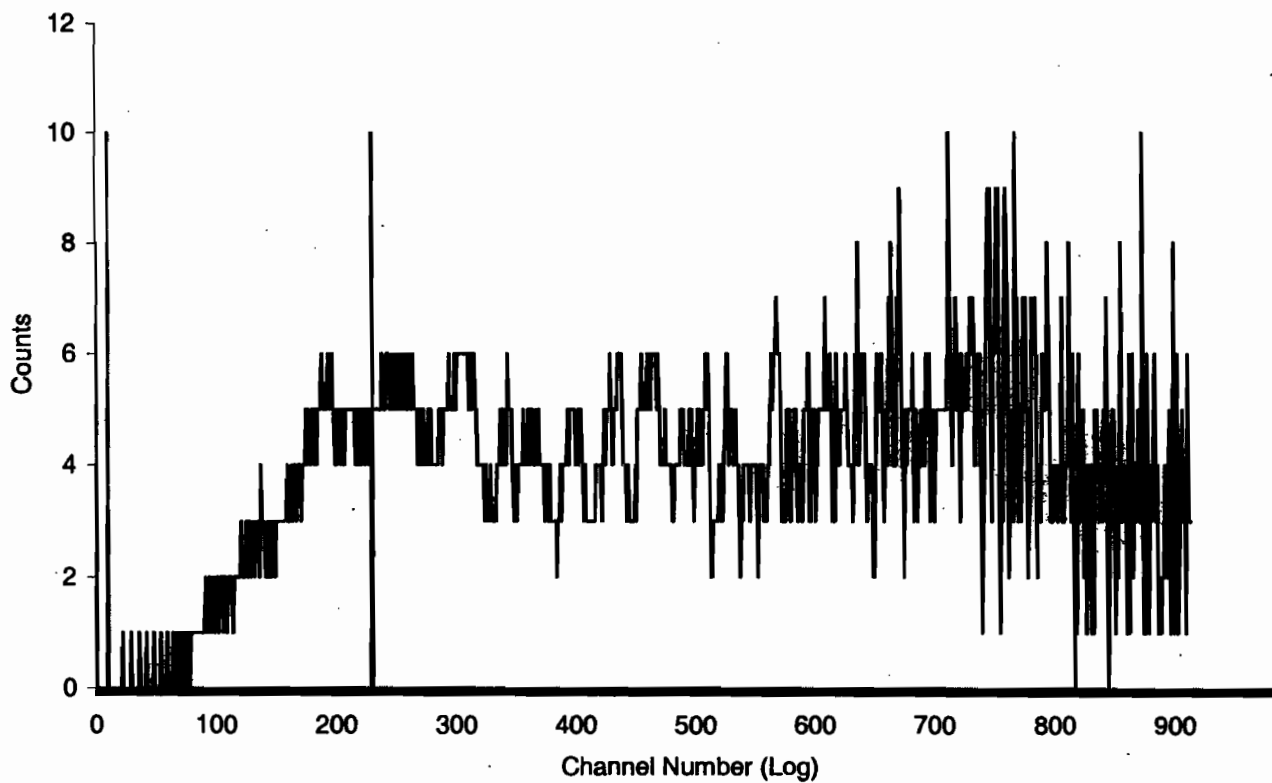
Sample Count Start Time:	3 Mar 2010 11:14:09		
Data Capture Date	03 Mar 2010 12:48:24		
User Filename	S02030357-1A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	57-1	95.00
H#, Total Counts:	118.7	3749	
Win1: Tritium - Start, End, Counts:	10	230	495
Win2: - Start, End, Counts:	0	990	3749



Sample Count Start Time:	3 Mar 2010 12:52:18		
Data Capture Date	03 Mar 2010 14:26:33		
User Filename	S02030357-2A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	57-2	95.00
H#, Total Counts:	118.5	3557	
Win1: Tritium - Start, End, Counts:	10	230	513
Win2: - Start, End, Counts:	0	990	3556

# SPECTRUM PLOT

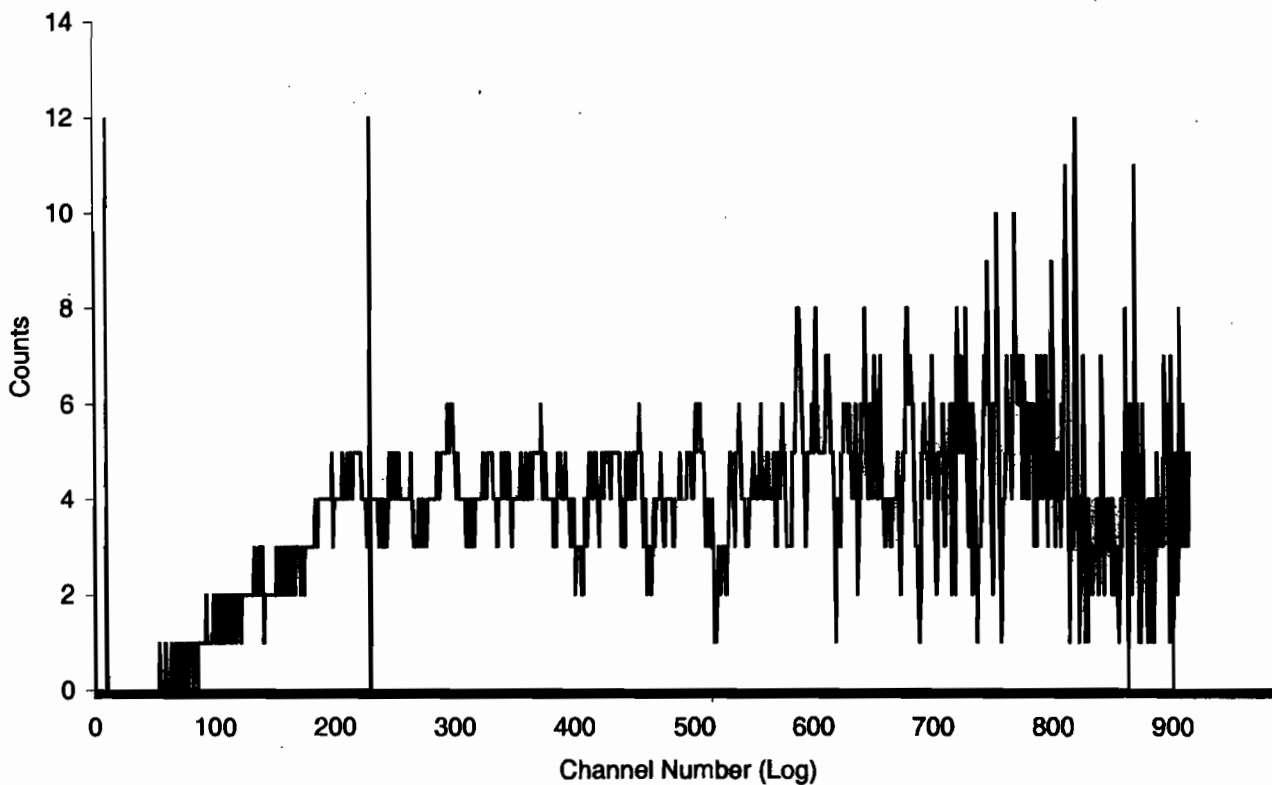
USER 02 - TRITIUM



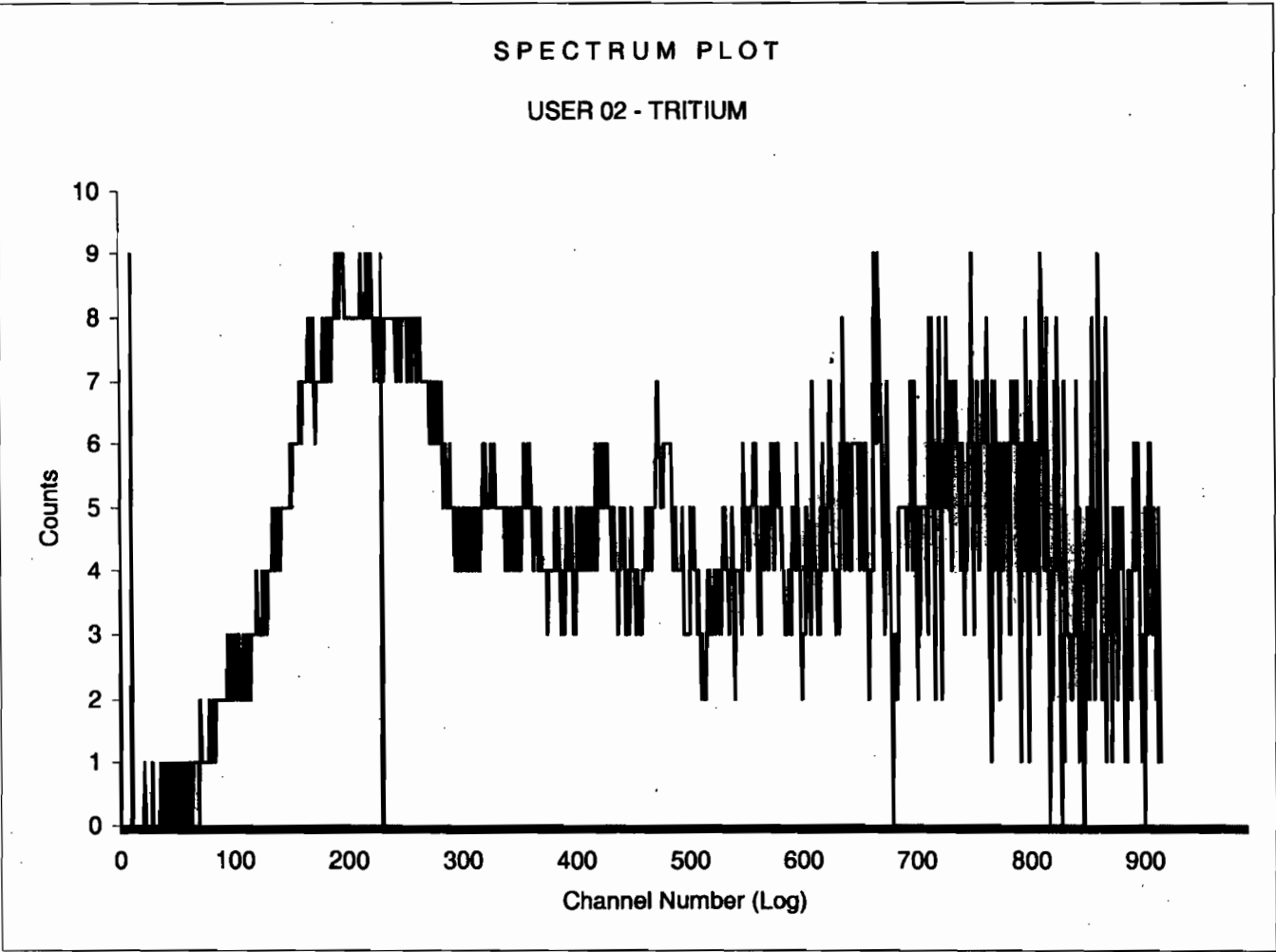
Sample Count Start Time:	3 Mar 2010 14:30:21		
Data Capture Date	03 Mar 2010 16:04:36		
User Filename	S02030357-3A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	57-3	95.00
H#, Total Counts:	119.0	3386	
Win1: Tritium - Start, End, Counts:	10	230	409
Win2: - Start, End, Counts:	0	990	3385

# SPECTRUM PLOT

USER 02 - TRITIUM

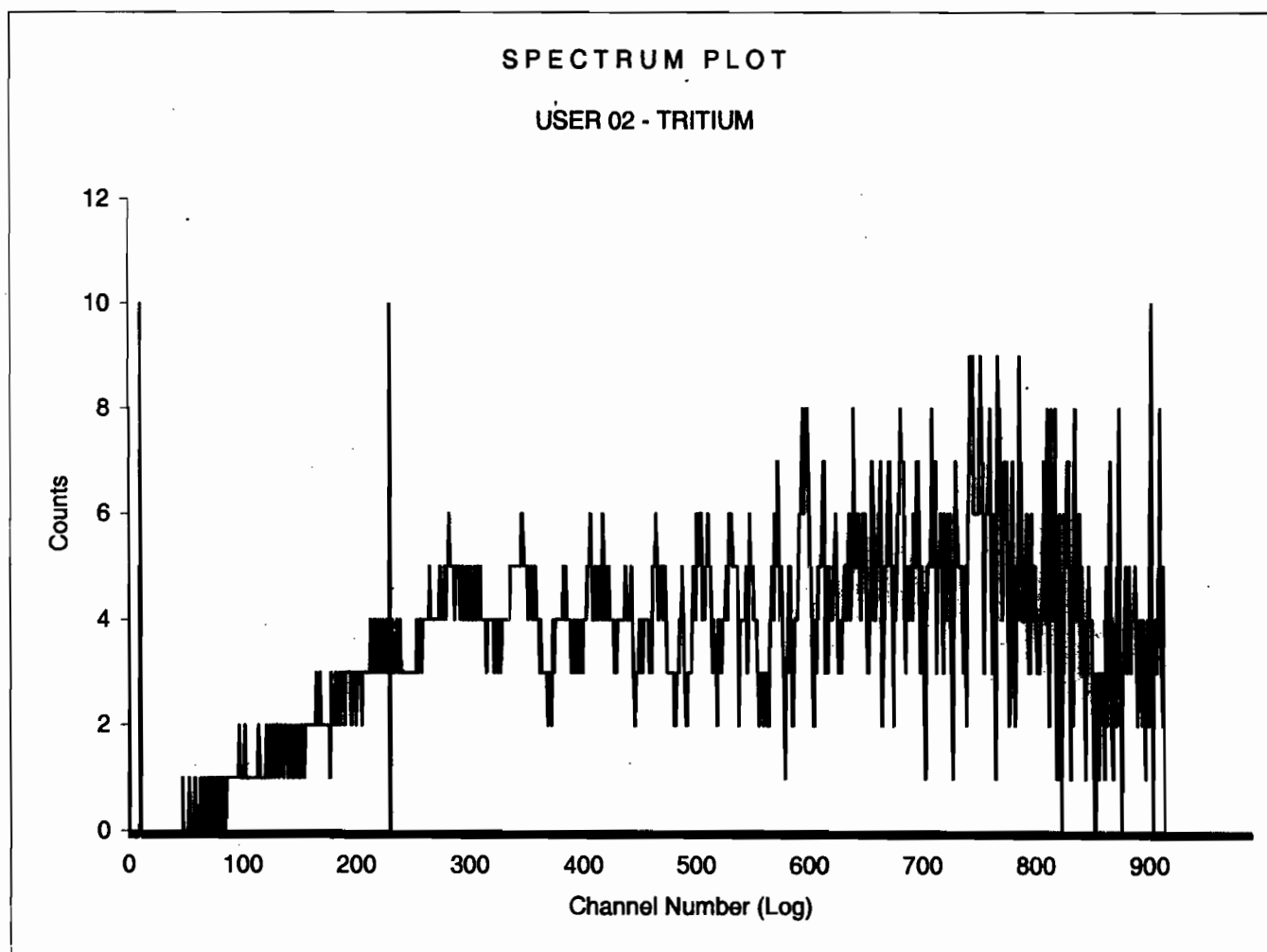


Sample Count Start Time:	3 Mar 2010 16:08:24		
Data Capture Date	03 Mar 2010 17:42:39		
User Filename	S02030357-4A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	57-4	95.00
H#, Total Counts:	118.7	4094	
Win1: Tritium - Start, End, Counts:	10	230	870
Win2: - Start, End, Counts:	0	990	4094

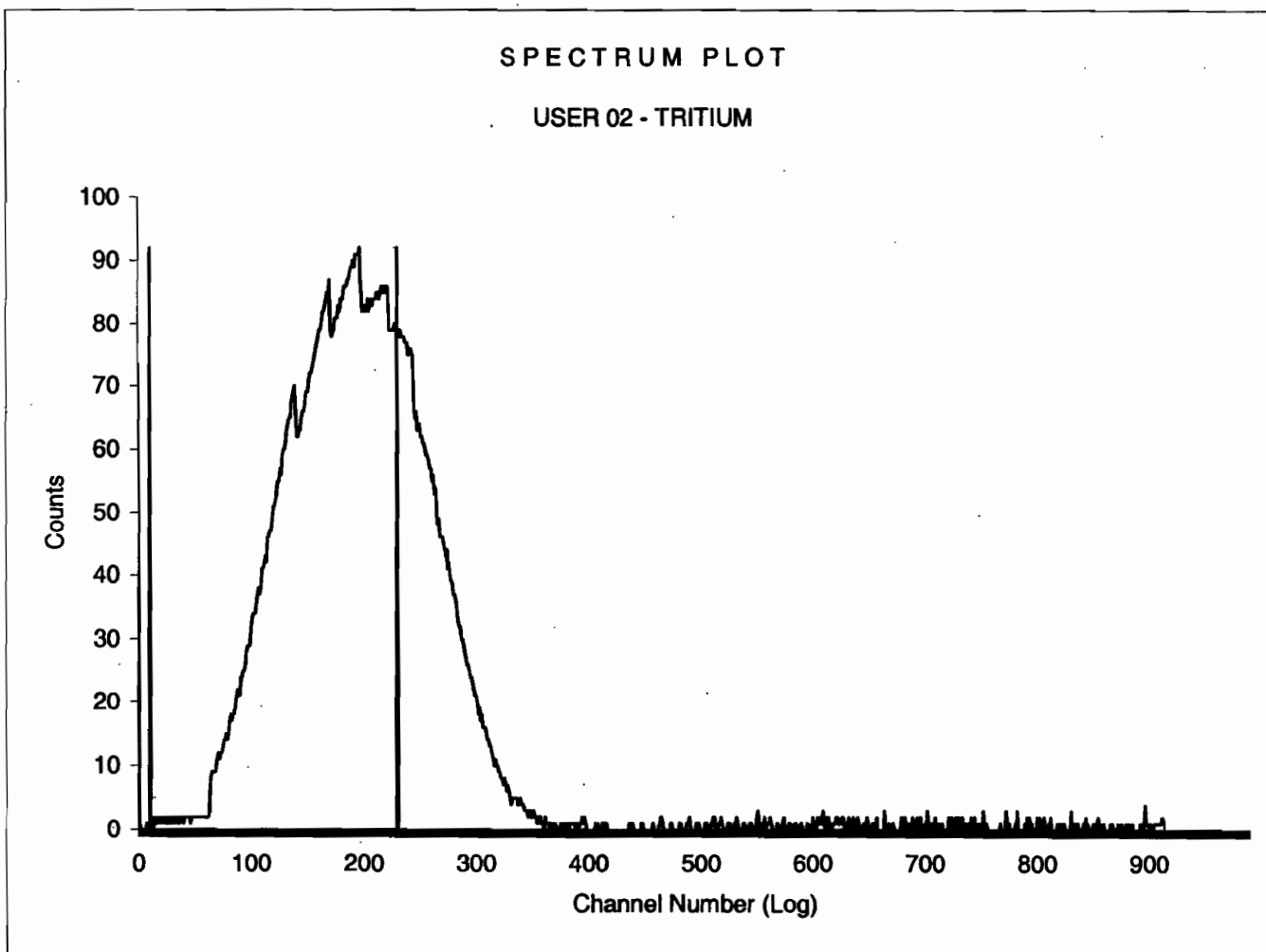




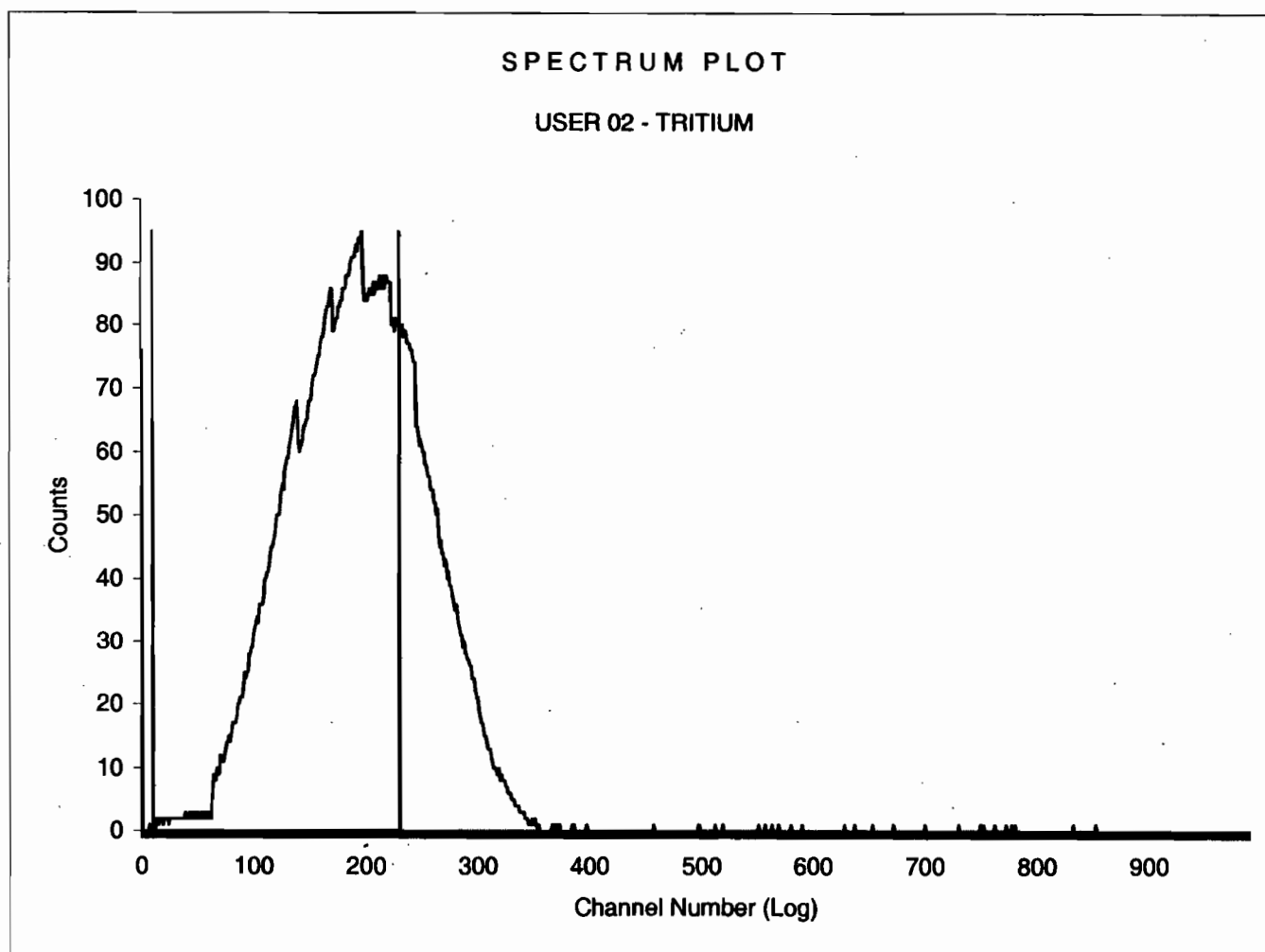
Sample Count Start Time:	3 Mar 2010 17:46:27		
Data Capture Date	03 Mar 2010 19:20:43		
User Filename	S02030357-5A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	57-5	95.00
H#, Total Counts:	118.5	3256	
Win1: Tritium - Start, End, Counts:	10	230	311
Win2: - Start, End, Counts:	0	990	3255



Sample Count Start Time:	3 Mar 2010 19:22:39		
Data Capture Date	03 Mar 2010 19:32:45		
User Filename	S02030357-6A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	57-6	10.85
H#, Total Counts:	117.0	14322	
Win1: Tritium - Start, End, Counts:	10	230	10117
Win2: - Start, End, Counts:	0	990	14322



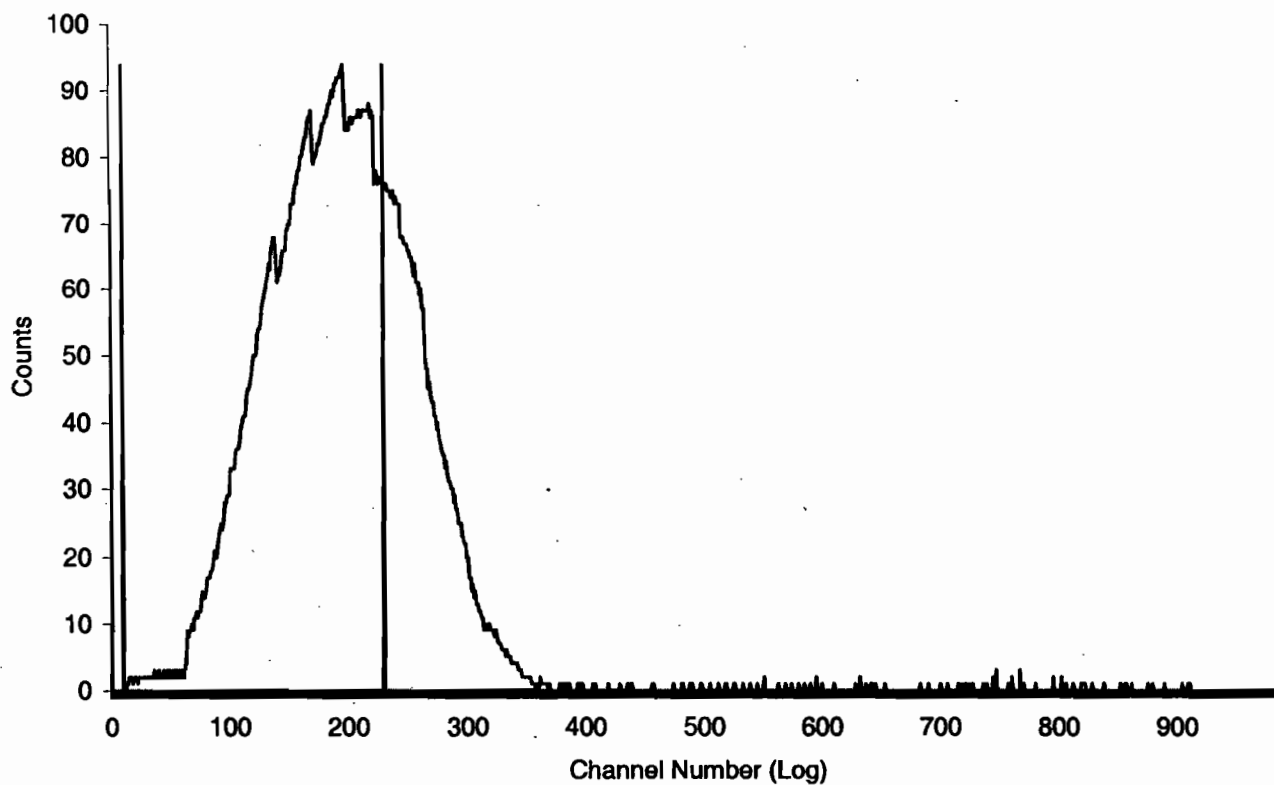
Sample Count Start Time:	3 Mar 2010 19:34:30		
Data Capture Date	03 Mar 2010 19:35:09		
User Filename	S02030357-7A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	57-7	1.45
H#, Total Counts:	118.5	13941	
Win1: Tritium - Start, End, Counts:	10	230	10156
Win2: - Start, End, Counts:	0	990	13939



Sample Count Start Time:	3 Mar 2010 19:36:55		
Data Capture Date	03 Mar 2010 19:41:20		
User Filename	S02030357-8A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	57-8	4.30
H#, Total Counts:	117.8	14141	
Win1: Tritium - Start, End, Counts:	10	230	10147
Win2: - Start, End, Counts:	0	990	14141

### SPECTRUM PLOT

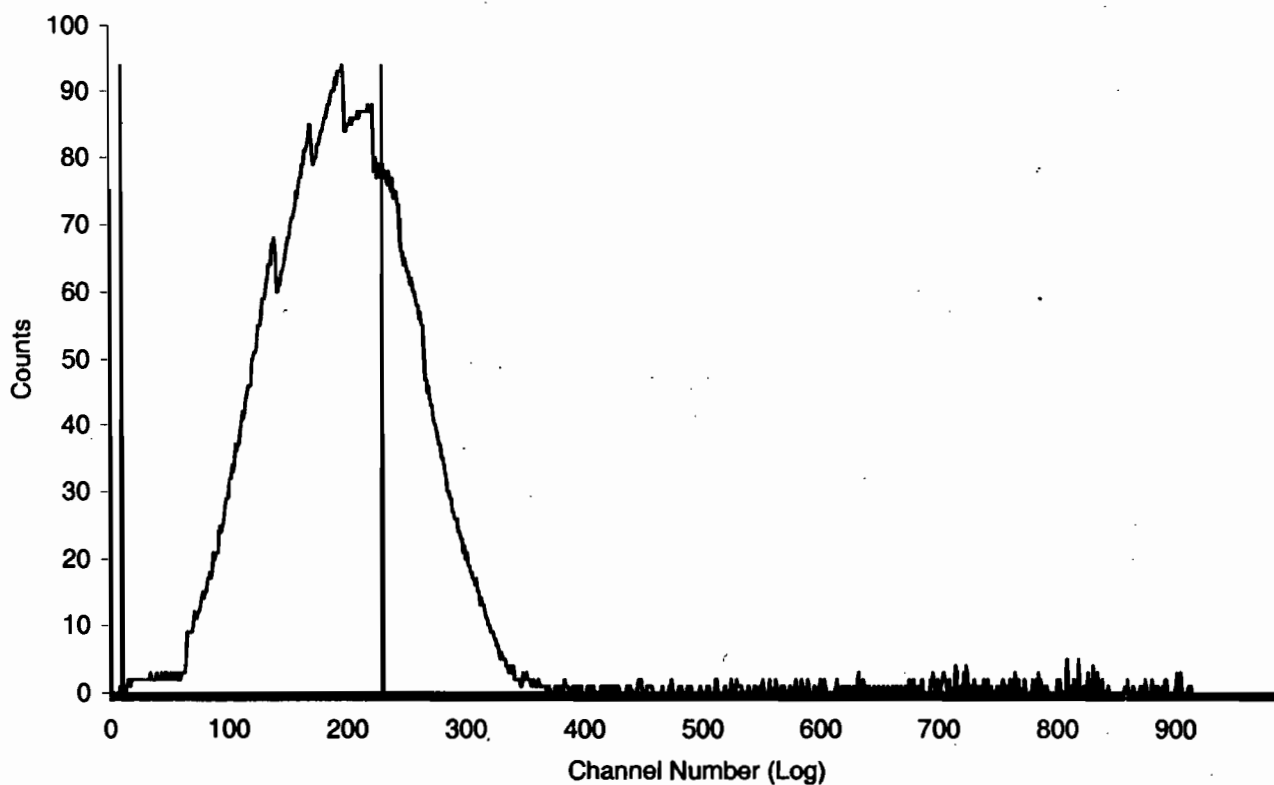
USER 02 - TRITIUM



Sample Count Start Time:	3 Mar 2010 19:42:25		
Data Capture Date	03 Mar 2010 19:52:58		
User Filename	S02030357-9A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	9	57-9	11.30
H#, Total Counts:	118.5	14267	
Win1: Tritium - Start, End, Counts:	10	230	10090
Win2: - Start, End, Counts:	0	990	14267

# SPECTRUM PLOT

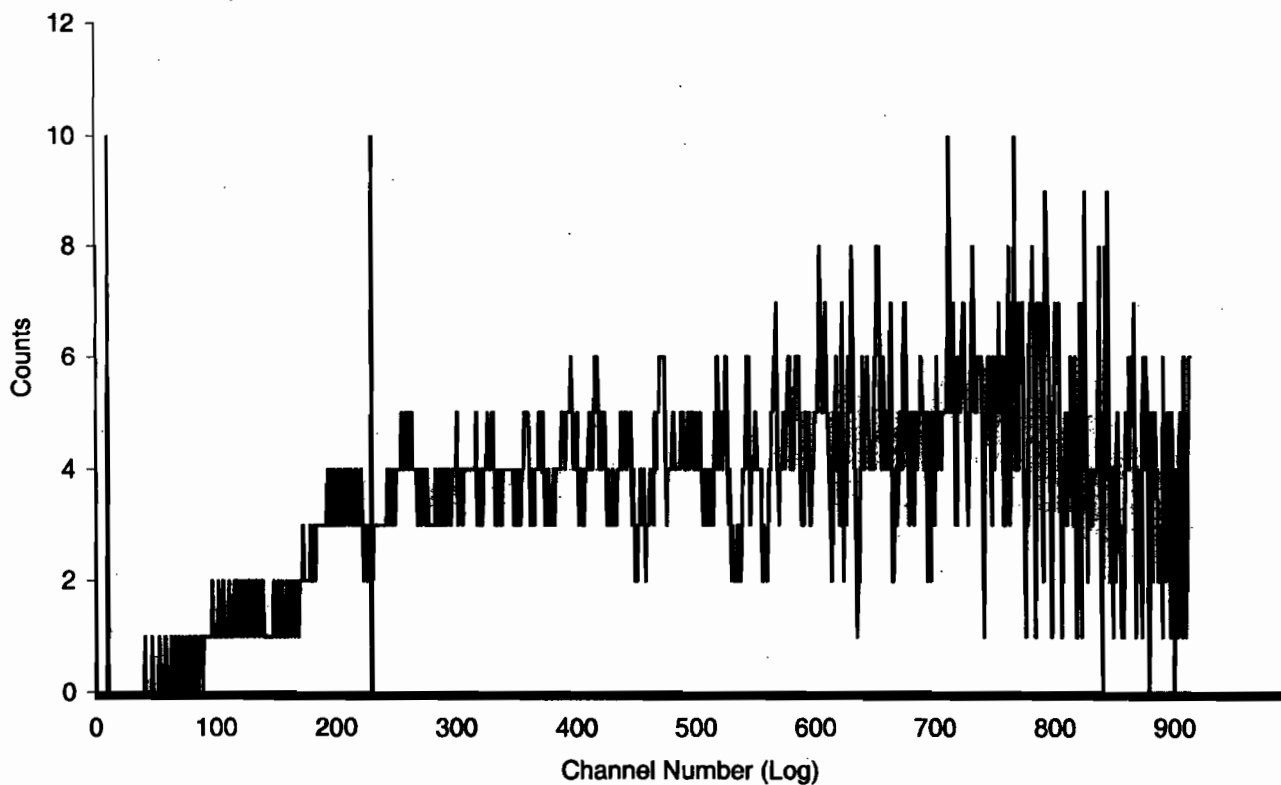
USER 02 - TRITIUM



Sample Count Start Time:	3 Mar 2010 19:56:46		
Data Capture Date	03 Mar 2010 21:31:01		
User Filename	S02030357-10A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	10	57-10	95.00
H#, Total Counts:	117.4	3231	
Win1: Tritium - Start, End, Counts:	10	230	312
Win2: - Start, End, Counts:	0	990	3230

# SPECTRUM PLOT

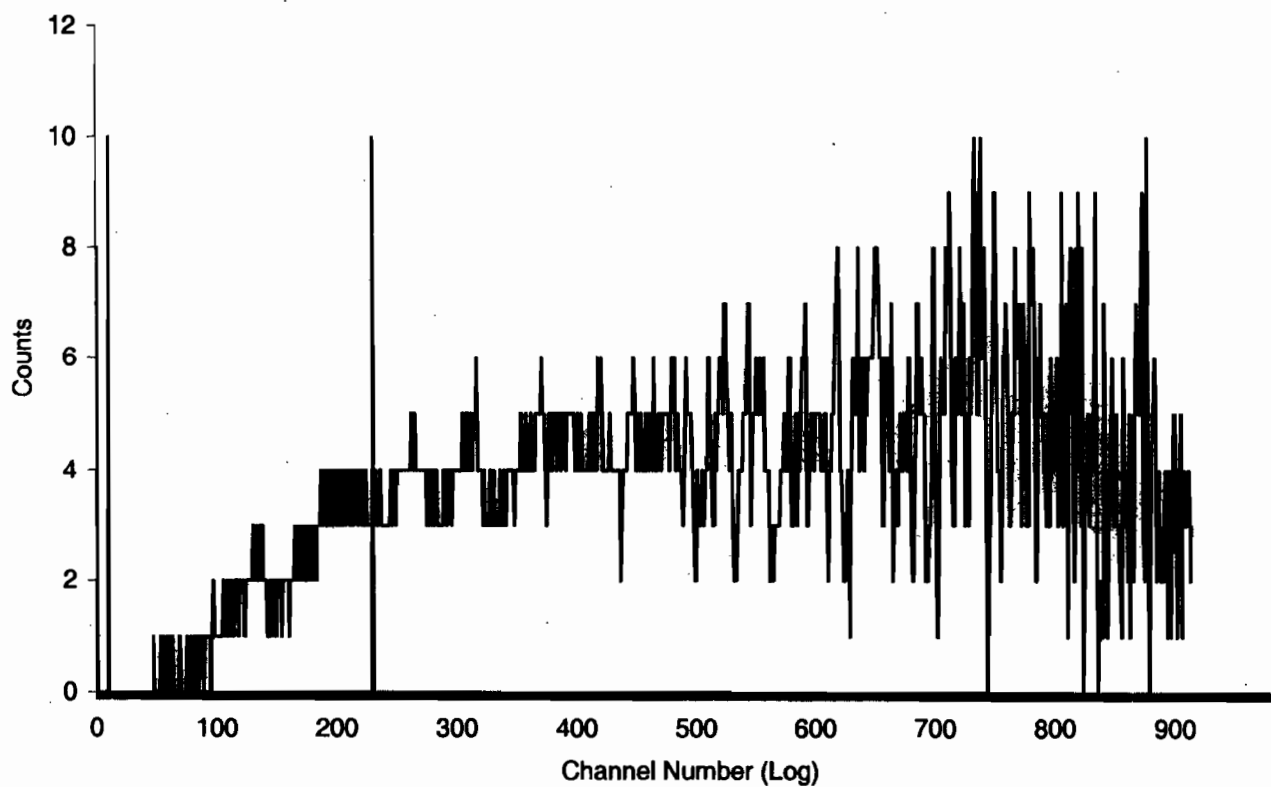
USER 02 - TRITIUM



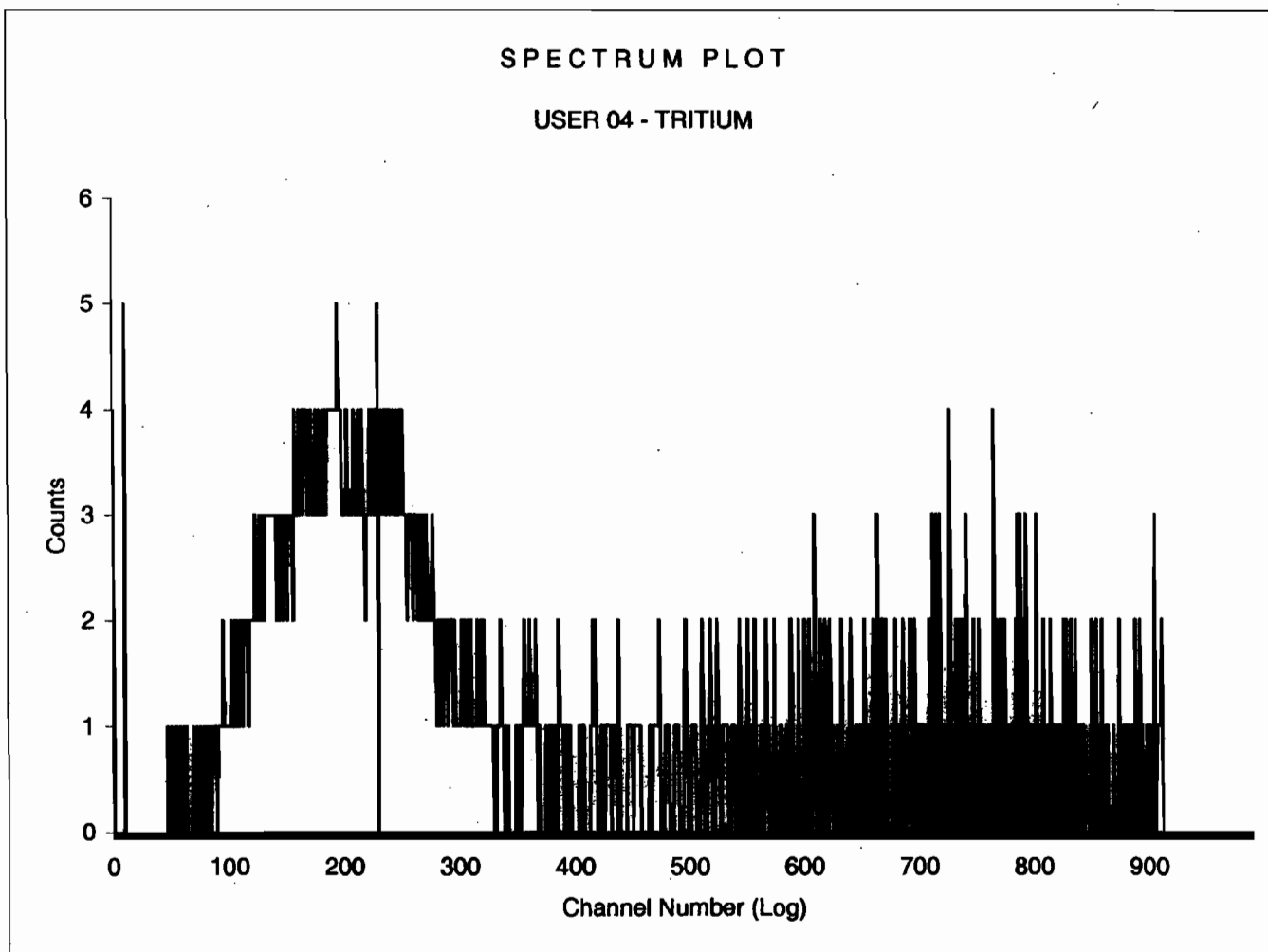
Sample Count Start Time:	3 Mar 2010 21:34:51		
Data Capture Date	03 Mar 2010 23:09:07		
User Filename	S02030357-11A.XLS		
	U02030357-1A.XLS		
Spectrum Type	Log Counts		
User Number	02		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	11	57-11	95.00
H#, Total Counts:	119.2	3377	
Win1: Tritium - Start, End, Counts:	10.	230	351
Win2: - Start, End, Counts:	0	990	3376

# SPECTRUM PLOT

USER 02 - TRITIUM



Sample Count Start Time:	4 Mar 2010 00:21:52		
Data Capture Date	04 Mar 2010 00:36:47		
User Filename	S04030439-1A.XLS		
	U04030439-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	GREEN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	39-1	15.00
H#, Total Counts:	117.5	1015	
Win1: Tritium - Start, End, Counts:	10	230	416
Win2: - Start, End, Counts:	0	990	1014





# Radiochemistry Batch Checklist, Rev10

Batch# 973351 Product: H3 Date: 4-9-10

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			NA
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD.	✓		
(If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

RADcheckistrev10, revised 1/13/2010

Primary Review Performed By: SM

Secondary Review Performed By: WHH

LA NL 3-18-10

# Tritium Que Sheet

08-APR-10

Batch #: 973351 Analyst: GXR1 First Client Due Date 18-MAR-10 Internal Due Date: 11-MAR-10  
 Spike Isotope: Hydrogen-3 Spike Code: 0134-K Expiration Date: 3/11/11 Vol: 0.1  
 LCS Isotope: Hydrogen-3 LCS Code: 0134-K Expiration Date: 3/11/11 Vol: 0.1

Prep Date: 4/8/10 Initials: g Pipet ID: 2970968 Witness: WJ 4/8/10

Sample ID	Client Samp ID	Type	Hazard Code	Min CRDL	Matrix	Client	Sample Date	Aliquot in vial (g/mL)	LSC Rack #	Dist Rig #	Vol added for Dist (mL)	Initial Sample Aliquot (g/mL)	Final Wt (g)	Dist Vol (mL)
247356002-1	RE15-10-8245	SAMPLE		6 pCi/g	SOIL	LANL010	13-FEB-10	10	43-2	15	50	3.28		13
247356005-1	RE15-10-8242	SAMPLE		6 pCi/g	SOIL	LANL010	13-FEB-10	10	43-3	56	50	3.35		13
247356007-1	RE15-10-8241	SAMPLE		6 pCi/g	SOIL	LANL010	13-FEB-10	10	43-4	83	50	3.44		13
247356008-1	RE15-10-8267	SAMPLE		6 pCi/g	SOIL	LANL010	13-FEB-10	10	43-5	106	50	3.40		13
1202091026-1	MB for batch 973351	MB		6 pCi/g	SOIL	QC ACCOUNT	13-FEB-10	10	43-6	107	50	3.44		13
1202091027-1	RE15-10-8245(247356002DUP)	DUP		6 pCi/g	SOIL	QC ACCOUNT	13-FEB-10	10	43-7	116	50	3.23		13
1202091028-1	RE15-10-8245(247356002MS)	MS		6 pCi/g	SOIL	QC ACCOUNT	13-FEB-10	10	10-1	295	50	3.26		13
1202091029-1	LCS for batch 973351	LCS		6 pCi/g	SOIL	QC ACCOUNT	13-FEB-10	10	10-2	500	50	3.44		13

Bkg Rack #: 43-1

balies ✓

Comments:

Bkg prepared with dead water? Yes/No

Instrument Used (circle as appropriate): LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500 (Gold) 7070506, LS6500 (Green) 7067404, Wallac (Yellow) 4140127, LS6000 (Brown) 7060655, Wallac (Pink) 2200082, Wallac (White) 4140299, Purple 7069123, Silver 7060656, Orange DG06095168

Calibration Used: Ecosci Ultra (10 mL sample/13 mL Ecosci Ultra)  
 Data Reviewed By: WJ 4-9-10

GEL Laboratories LLC, Radiochemistry Division

## Tritium Solid

Filename : H3DST.XLS  
File type : Excel  
Version # : 1.2.6

LCS S/N : 0134-K  
LCS Exp Date : 3/11/2011  
LCS Activity (dpm/ml): 2447.00  
LCS Volume Added: 0.10

Spike S/N : 0134-K  
Spike Exp Date : 3/11/2011  
Spike Activity (dpm/ml): 2447.00  
Spike Volume Added: 0.10

Batch : 973351  
Analyst : GXR1  
Prep Date : 4/8/2010

Procedure Code : LSCDSH3S  
Paramname : Tritium  
Required MDC : 6 pCi/G  
Half-life of Tritium : 12.32 years

H-3 Abundance : 1  
Method Uncertainty : 0.1155  
Geometry: 10mL DW/13mL Ecocint  
Ultra

Pipet, 0.1 ml Stdev : +/- 0.000701 ml  
Pipet, 0.5 ml Stdev : +/- 0.002564 ml  
Pipet, 1.0 ml Stdev : +/- 0.005480 ml  
Pipet, 5.0 ml Stdev : +/- 0.025729 ml

Sample Characteristics		Total Sample Volume (L)		Sample Aliquot G		Sample Aliquot StDev. G		Distilled Sample Counted L		Sample Counted StDev. L		Flg number		Sample Date/Time	
Pos.	Sample ID														
1	247356002.1	0.0500		3.2800		3.5593E-03		0.0100		2.5729E-05		15		2/13/2010 12:00	
2	247356005.1	0.0500		3.3500		3.5685E-03		0.0100		2.5729E-05		56		2/13/2010 12:00	
3	247356007.1	0.0500		3.4400		3.5757E-03		0.0100		2.5729E-05		83		2/13/2010 12:00	
4	247356008.1	0.0500		3.4000		3.5716E-03		0.0100		2.5729E-05		106		2/13/2010 12:00	
5	1202091026.1	0.0500		3.4400		3.5757E-03		0.0100		2.5729E-05		107		4/8/2010 0:00	
6	1202091027.1	0.0500		3.2300		3.5541E-03		0.0100		2.5729E-05		116		2/13/2010 12:00	
7	1202091028.1	0.0500		3.2600		3.5572E-03		0.0100		2.5729E-05		285		2/13/2010 12:00	
8	1202091029.1	0.0500		3.4400		3.5757E-03		0.0100		2.5729E-05		500		4/8/2010 0:00	

Analytical SOP: GL-RAD-A-002  
Instrument SOP: GL-RAD-I-004

Count raw Data				Background				Calibration Data				Backgrounds			
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	cpm	Count Time (min.)	Count Start Date/Time	Sample Decay	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Rack Position #	Count Start Date/Time
1	43-2	60	126.5	8.05	4.28	60	4/8/2010 19:36	0.992	LSCBLUE	8/21/2009	8/31/2010	0.1995	0.00792	43-1	4/8/2010 18:34
2	43-3	60	128.7	21.7	4.28	60	4/8/2010 20:39	0.982	LSCBLUE	8/21/2009	8/31/2010	0.1863	0.00792	43-1	4/8/2010 18:34
3	43-4	60	129.7	19.23	4.28	60	4/8/2010 21:41	0.992	LSCBLUE	8/21/2009	8/31/2010	0.1948	0.00792	43-1	4/8/2010 18:34
4	43-5	60	131.4	22.73	4.28	60	4/8/2010 22:44	0.992	LSCBLUE	8/21/2009	8/31/2010	0.1922	0.00792	43-1	4/8/2010 18:34
5	43-6	60	127.3	4.13	4.28	60	4/8/2010 23:46	1.000	LSCBLUE	8/21/2009	8/31/2010	0.1984	0.00792	43-1	4/8/2010 18:34
6	43-7	60	130.2	6.82	4.28	60	4/9/2010 0:49	0.992	LSCBLUE	8/21/2009	8/31/2010	0.1940	0.00792	43-1	4/8/2010 18:34
7	10-1	15	128.2	16.13	4.28	60	4/9/2010 1:49	0.992	LSCBLUE	8/21/2009	8/31/2010	0.1970	0.00792	43-1	4/8/2010 18:34
8	10-2	15	129.3	14.33	4.28	60	4/9/2010 2:05	1.000	LSCBLUE	8/21/2009	8/31/2010	0.1954	0.00792	43-1	4/8/2010 18:34

## Notes:

- 1 - Results are decay corrected to Sample Date/Time  
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date  
 3 - Spike Nominals are decay corrected to Sample Date/Time

Results		1 SIGMA										1 SIGMA			
Pos.	Decision Level	Critical Level	Required MDC	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate	Counting Uncertainty	Total Prop. Uncertainty	Sample OC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
1	3.0540	2.1562	6	4.4859	13.0828	0.1206	3.7700	0.4533	1.5731	2.1843	SAMPLE				
2	3.0401	2.1463	6	4.4854	60.1750	0.0388	17.4200	0.6580	2.2731	7.3315	SAMPLE				
3	2.9834	2.1063	6	4.3821	50.6793	0.0428	14.9500	0.6260	2.1220	6.2421	SAMPLE				
4	3.0588	2.1595	6	4.4929	64.1254	0.0374	18.4500	0.6709	2.3320	7.7853	SAMPLE				
5	2.9054	2.0513	6	4.2676	-0.4952	2.4959	-0.1500	0.3744	1.2360	1.2360	MB				
6	3.1897	2.2520	6	4.6852	9.2080	0.1696	2.5400	0.4301	1.5589	1.8887	DUP	34.8%	0.4759	34.0912	84.5%
7	4.9209	3.4742	6	7.8557	41.9061	0.0908	11.8500	1.0708	3.7868	6.1565	MS			32.0422	105.1%
8	4.6641	3.2929	6	7.2562	33.6860	0.1012	10.0500	1.0132	3.3962	5.1730	LCS				

## ID: TRITIUM

8 APR 2010 18:29

USER: 4

COMMENT: BLUE

PRESET TIME : 60.00  
 DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : EDIT  
 COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT  
 TWO PHASE : NO AGC : NO CYCLE REPEATS : 1 DISK : OFF  
 SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF  
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 20.0 - 270.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0  
 CHAN: 0.0 - 990.0 %ERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	43-1	60.00	129.0	4.28	13.50	40.67	4.09	1.78	61.99
2	43-2	60.00	126.5	8.05	9.57	43.62	3.95	1.86	124.56
3	43-3	60.00	128.7	21.70	5.63	60.02	3.35	1.20	187.07
4	43-4	60.00	129.7	19.23	5.97	56.55	3.45	0.98	249.53
5	43-5	60.00	131.4	22.73	5.47	60.60	3.33	0.86	311.99
6	43-6	60.00	127.3	4.13	13.37	38.75	4.17	1.21	374.44
7	43-7	60.00	130.2	6.82	10.26	44.70	3.88	1.19	436.90

PAGE: 1

ID: TRITIUM

9 APR 2010 01:47

USER: 5 COMMENT: BLUE  
PRESET TIME : 15.00  
DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : EDIT  
COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT  
TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF  
SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0 RWM LIST : OFF  
LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 20.0 - 270.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0  
CHAN: 0.0 - 990.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

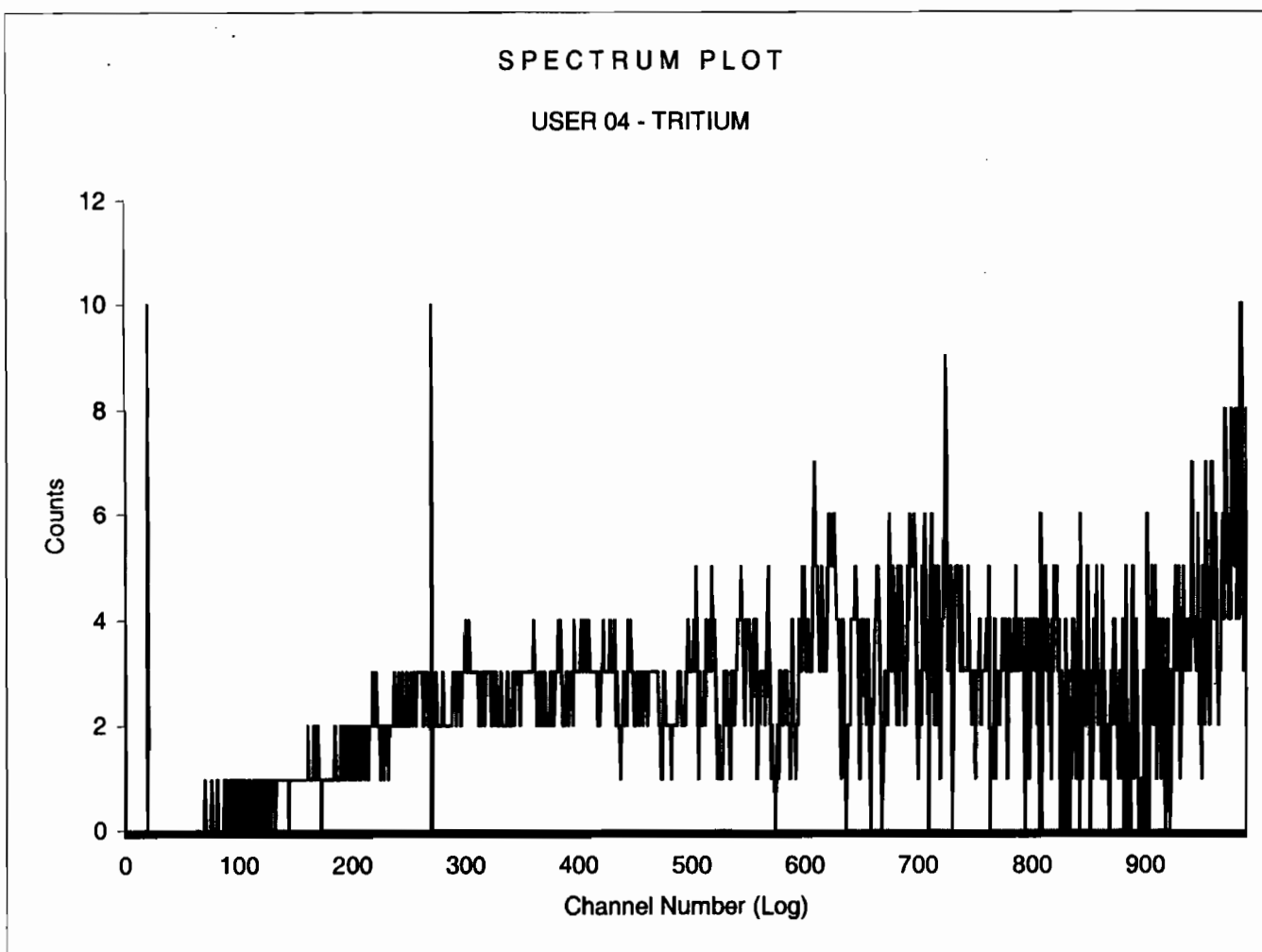
ALPHA-BETA DISCRIMINATION: NO

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	10-1	15.00	128.2	16.13	12.96	52.27	7.16	0.80	15.84
2	10-2	15.00	129.3	14.33	13.77	50.73	7.27	0.90	32.19

INSTRUMENT CALIBRATION: Mini 9 APR 2010 02:23

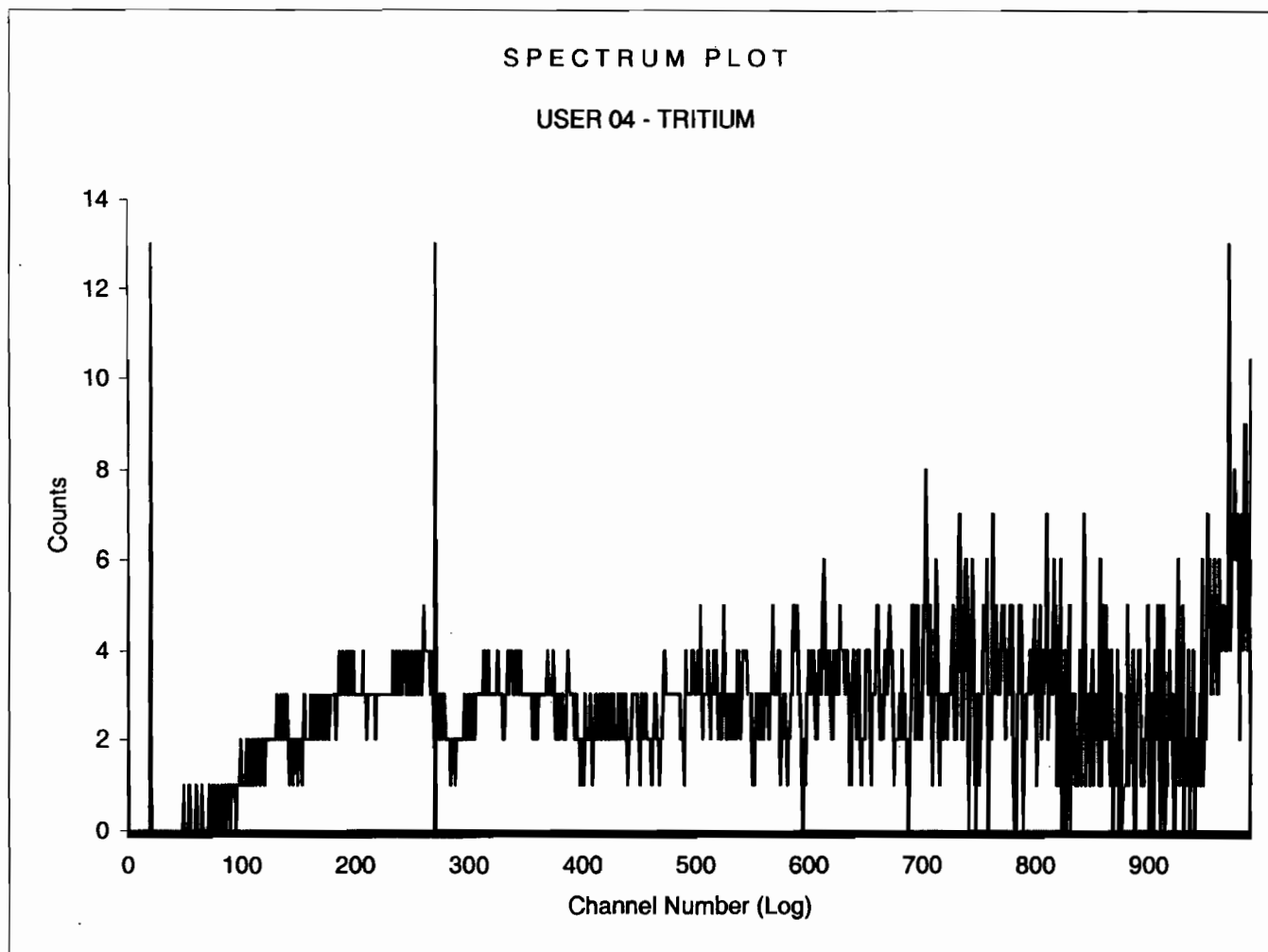
Calibration successful

Sample Count Start Time:	8 Apr 2010 18:34:10		
Data Capture Date	08 Apr 2010 19:31:30		
User Filename	S04040843-1A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	43-1	60.00
H#, Total Counts:	129.0	2780	
Win1: Tritium - Start, End, Counts:	20	270	260
Win2: - Start, End, Counts:	0	990	2450

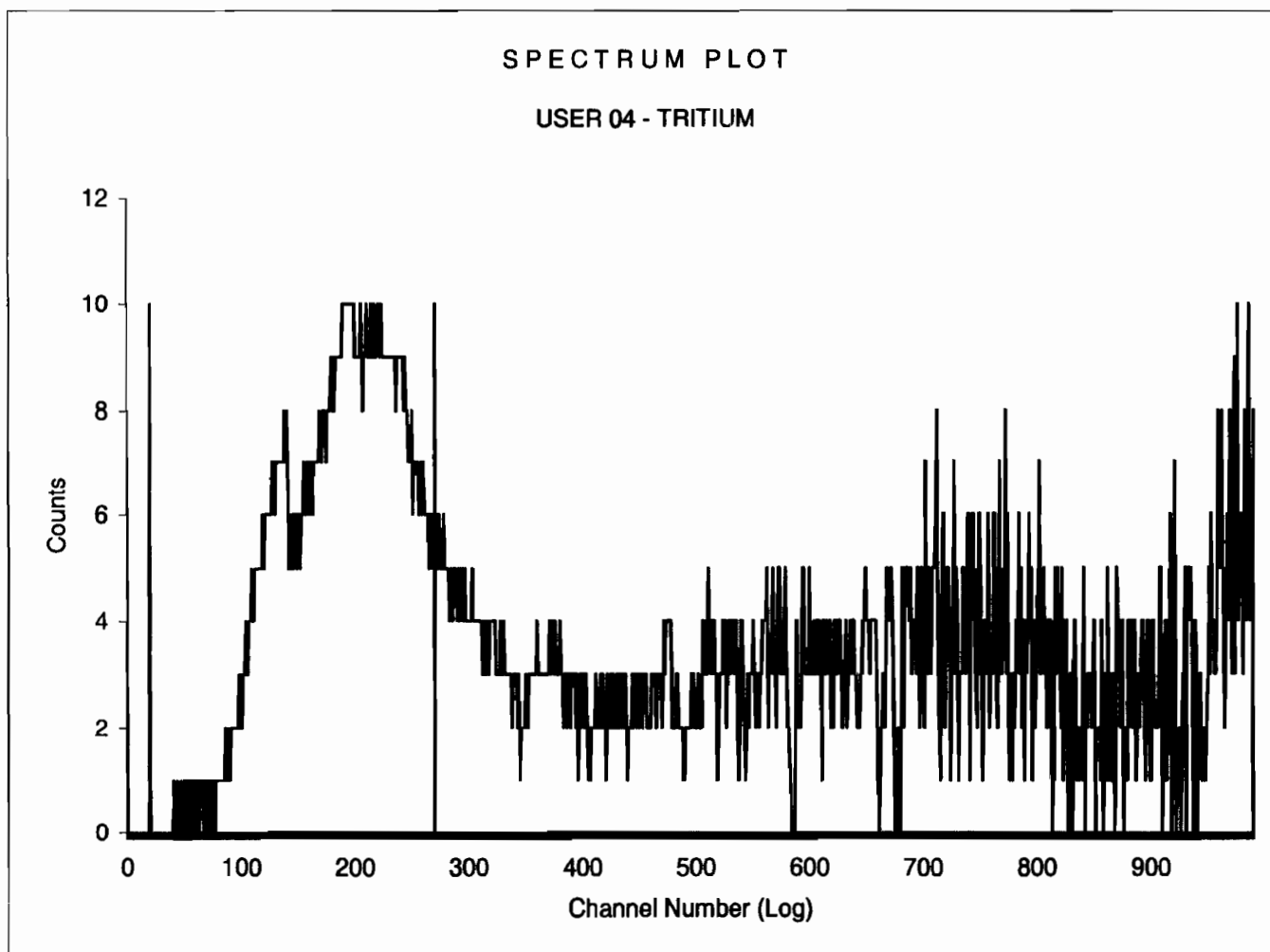




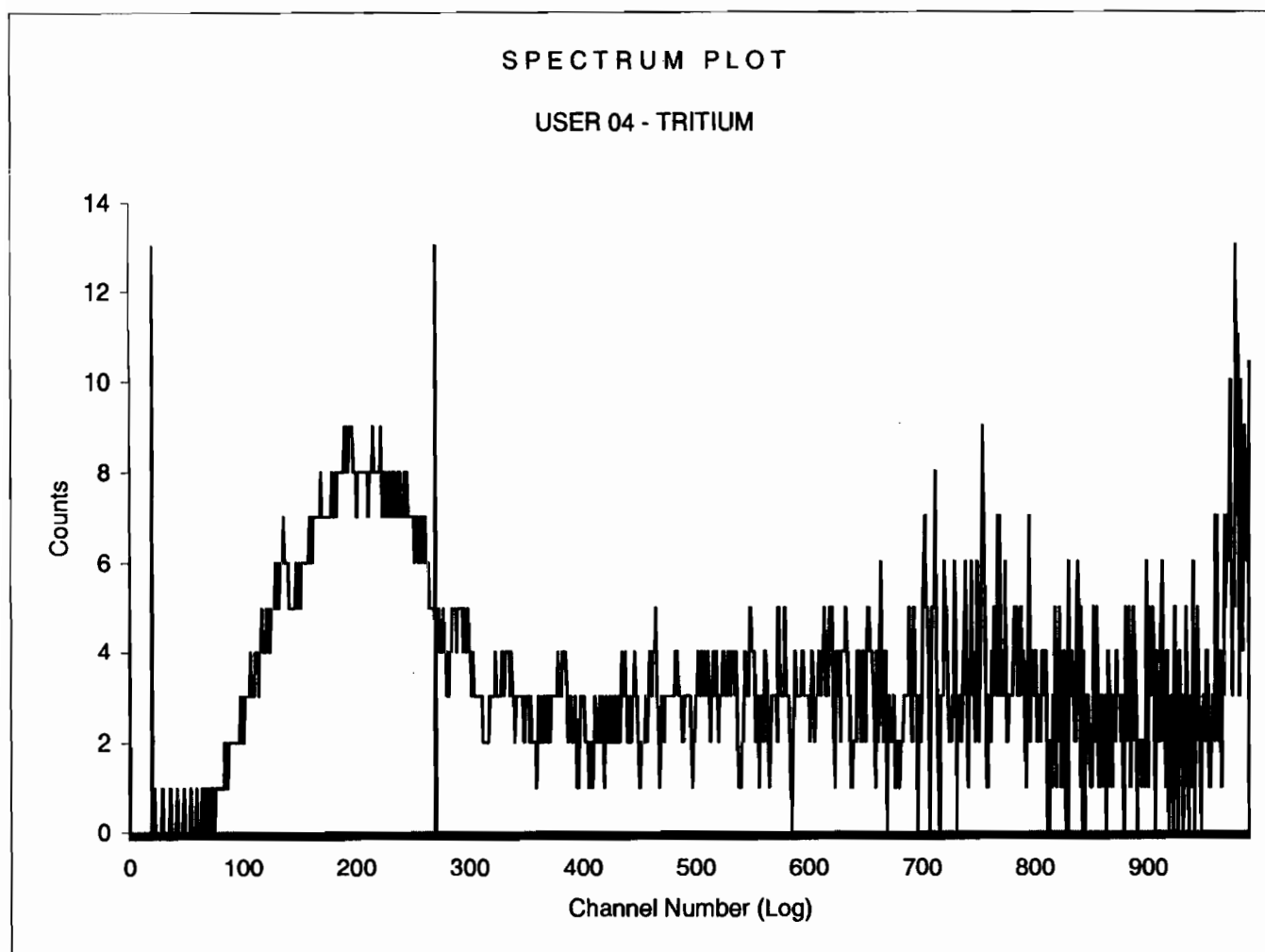
Sample Count Start Time:	8 Apr 2010 19:36:45		
Data Capture Date	08 Apr 2010 20:34:04		
User Filename	S04040843-2A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	43-2	60.00
H#, Total Counts:	126.5	2961	
Win1: Tritium - Start, End, Counts:	20	270	486
Win2: - Start, End, Counts:	0	990	2627



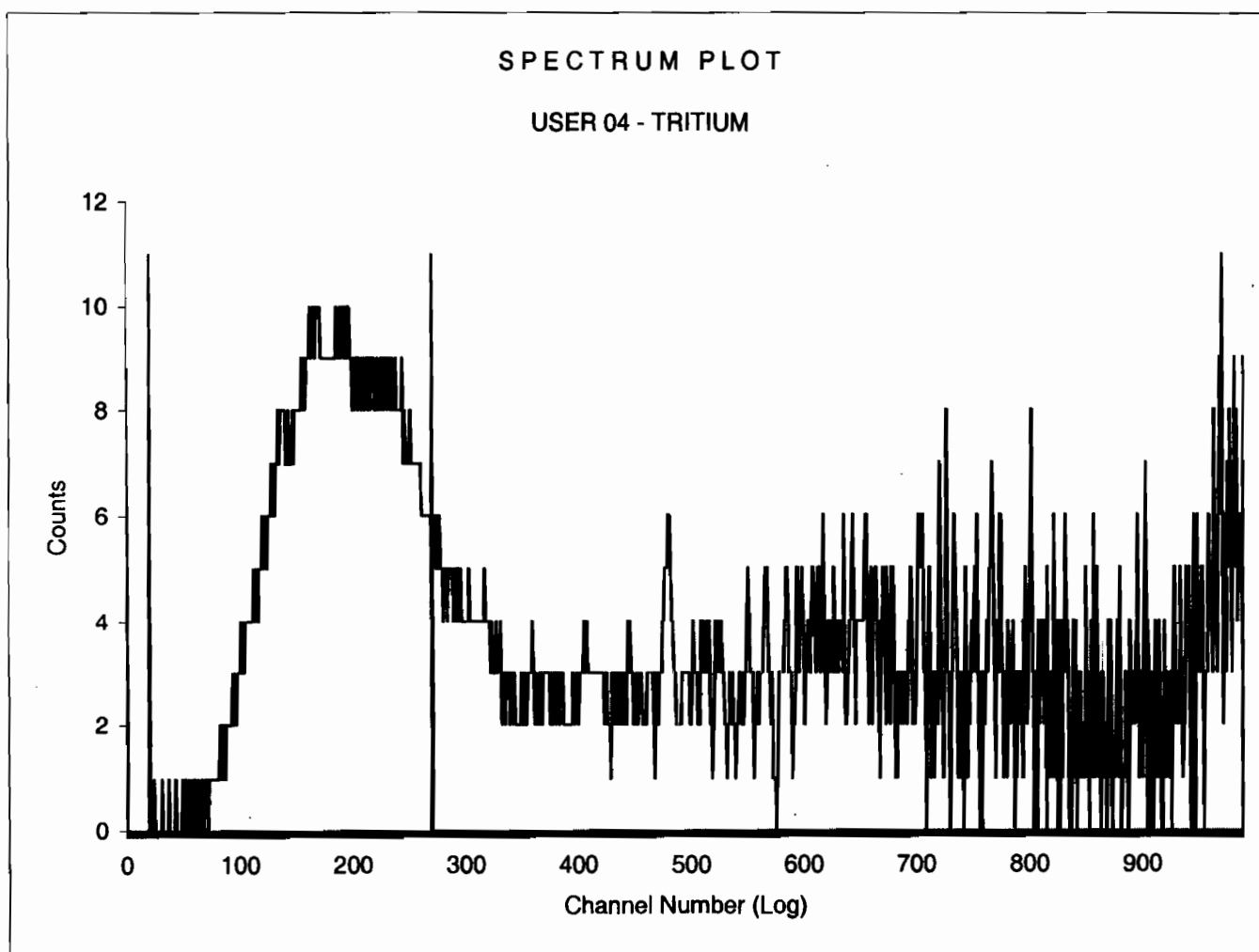
Sample Count Start Time:	8 Apr 2010 20:39:15		
Data Capture Date	08 Apr 2010 21:36:35		
User Filename	S04040843-3A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	43-3	60.00
H#, Total Counts:	128.7	3977	
Win1: Tritium - Start, End, Counts:	20	270	1307
Win2: - Start, End, Counts:	0	990	3605



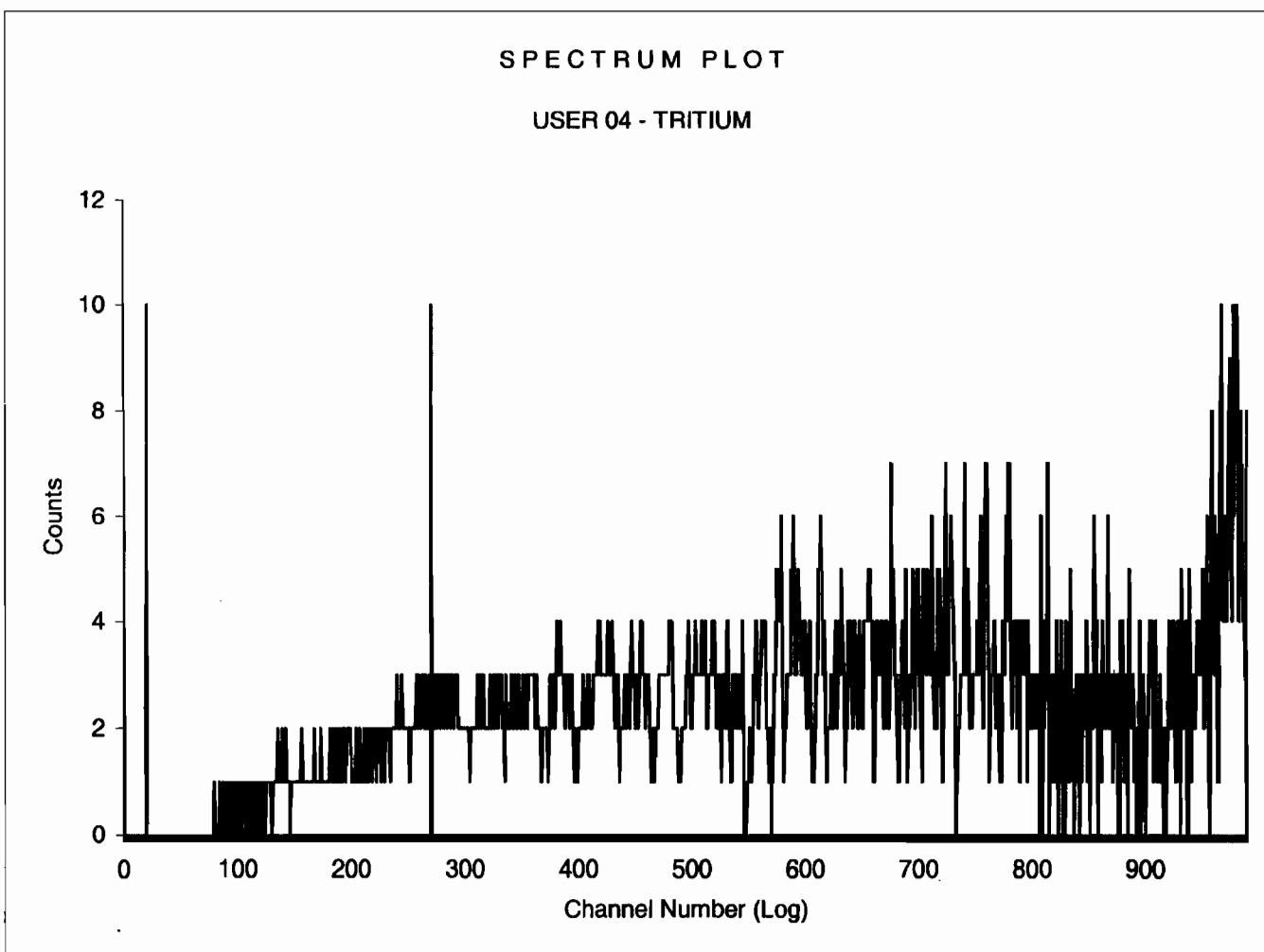
Sample Count Start Time:	8 Apr 2010 21:41:43		
Data Capture Date	08 Apr 2010 22:39:33		
User Filename	S04040843-4A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	4	43-4	60.00
H#, Total Counts:	129.7	3773	
Win1: Tritium - Start, End, Counts:	20	270	1159
Win2: - Start, End, Counts:	0	990	3402



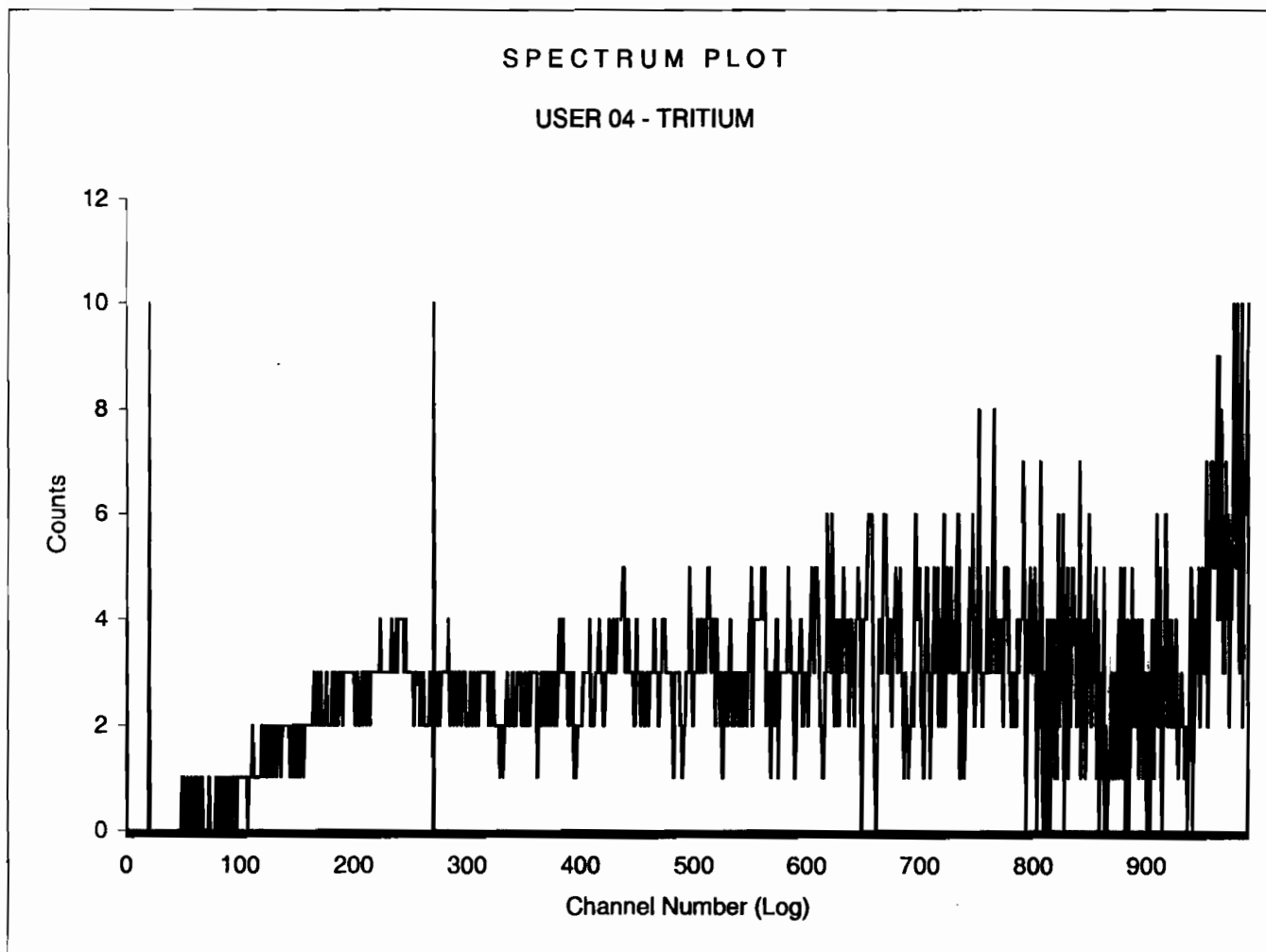
Sample Count Start Time:	8 Apr 2010 22:44:10		
Data Capture Date	08 Apr 2010 23:41:30		
User Filename	S04040843-5A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	43-5	60.00
H#, Total Counts:	131.4	3924	
Win1: Tritium - Start, End, Counts:	20	270	1370
Win2: - Start, End, Counts:	0	990	3642



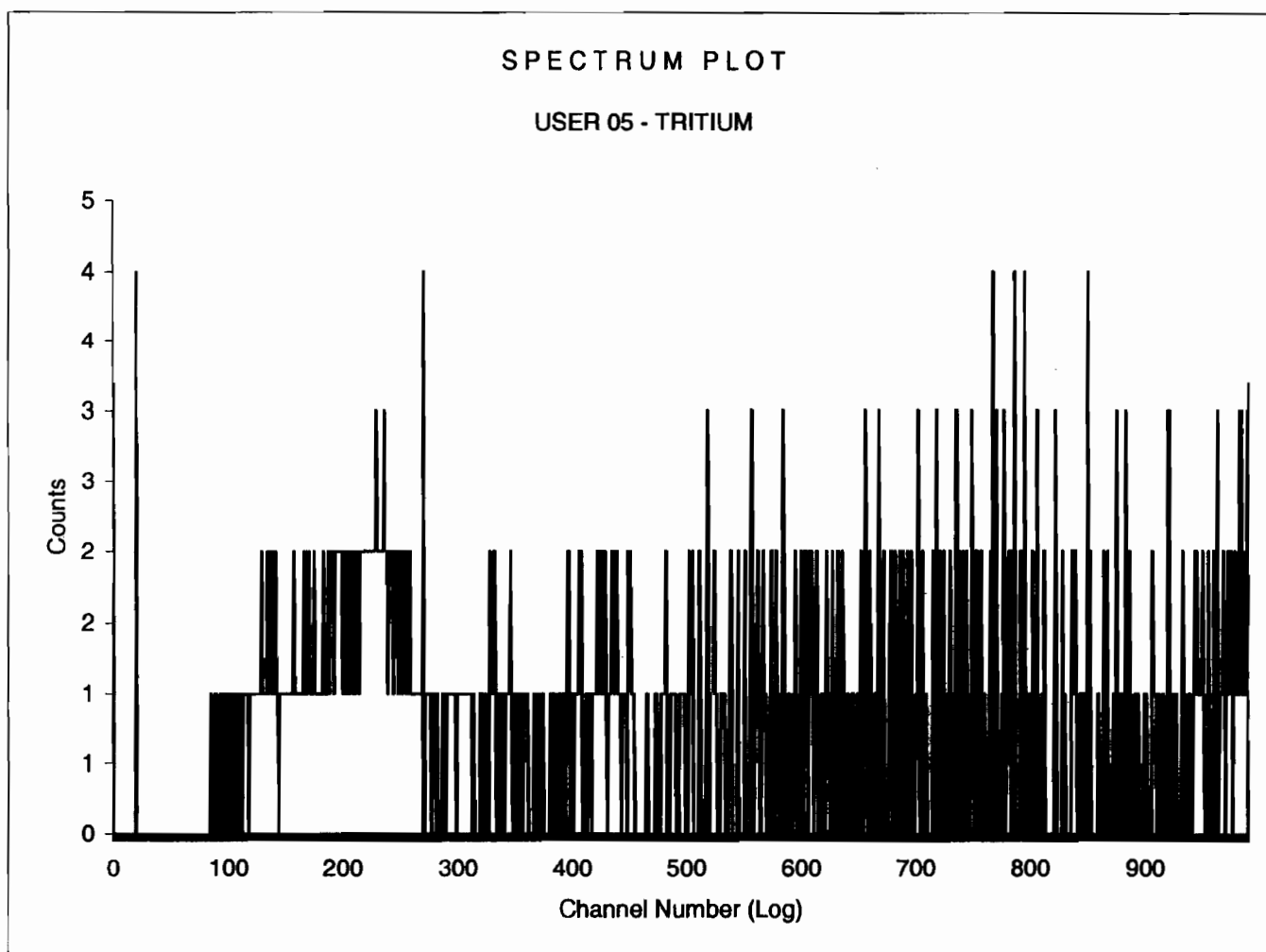
Sample Count Start Time:	8 Apr 2010 23:46:37		
Data Capture Date	09 Apr 2010 00:43:57		
User Filename	S04040943-6A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	6	43-6	60.00
H#, Total Counts:	127.3	2674	
Win1: Tritium - Start, End, Counts:	20	270	250
Win2: - Start, End, Counts:	0	990	2335



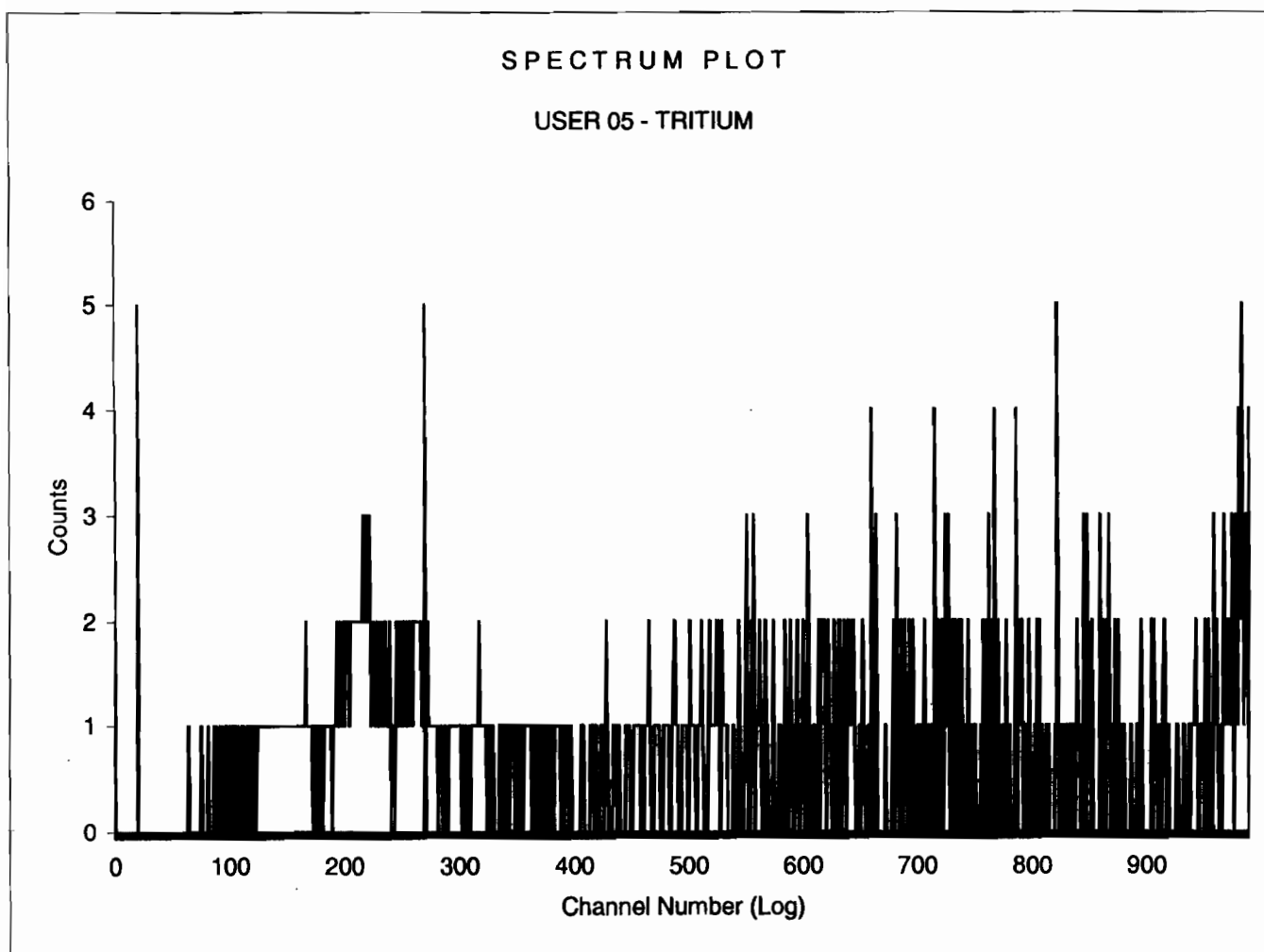
Sample Count Start Time:	9 Apr 2010 00:49:05		
Data Capture Date	09 Apr 2010 01:46:25		
User Filename	S04040943-7A.XLS		
	U04040843-1A.XLS		
Spectrum Type	Log Counts		
User Number	04		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	43-7	60.00
H#, Total Counts:	130.2	3026	
Win1: Tritium - Start, End, Counts:	20	270	412
Win2: - Start, End, Counts:	0	990	2694



Sample Count Start Time:	9 Apr 2010 01:49:12		
Data Capture Date	09 Apr 2010 02:03:00		
User Filename	S05040910-1A.XLS		
	U05040910-1A.XLS		
Spectrum Type	Log Counts		
User Number	05		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	10-1	15.00
H#, Total Counts:	128.2	864	
Win1: Tritium - Start, End, Counts:	20	270	242
Win2: - Start, End, Counts:	0	990	785

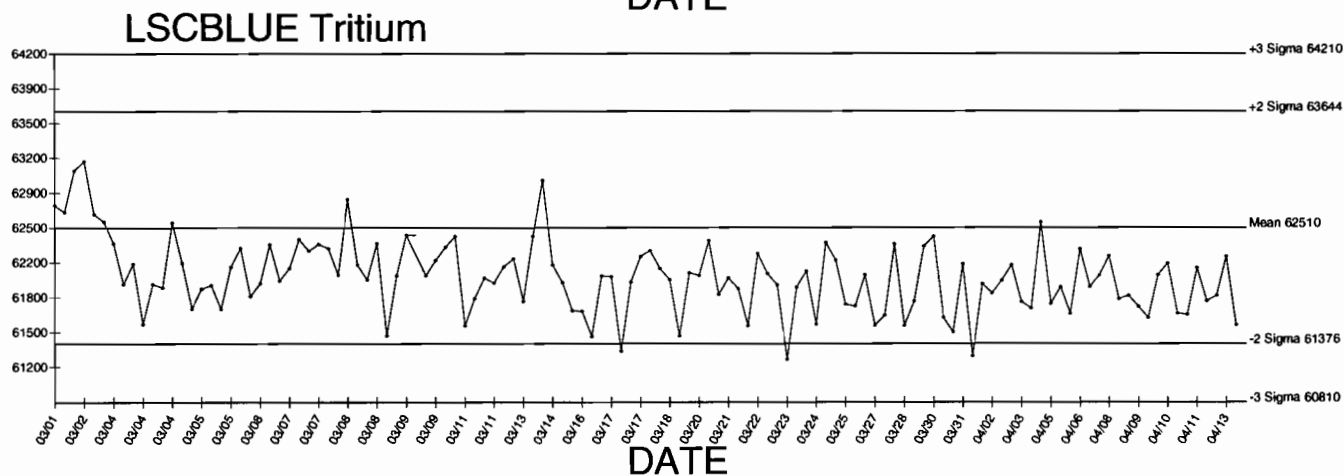
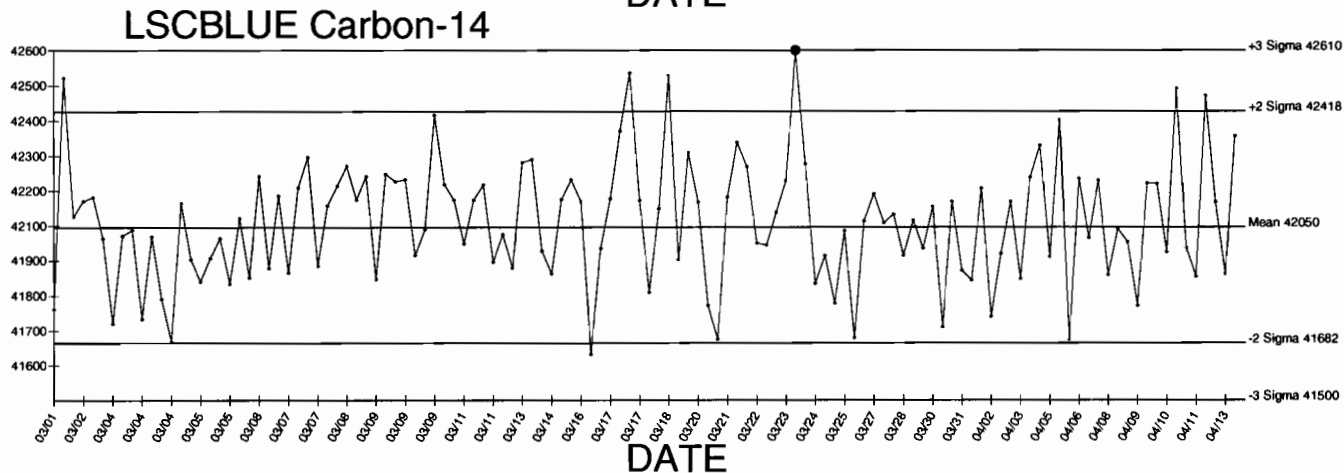
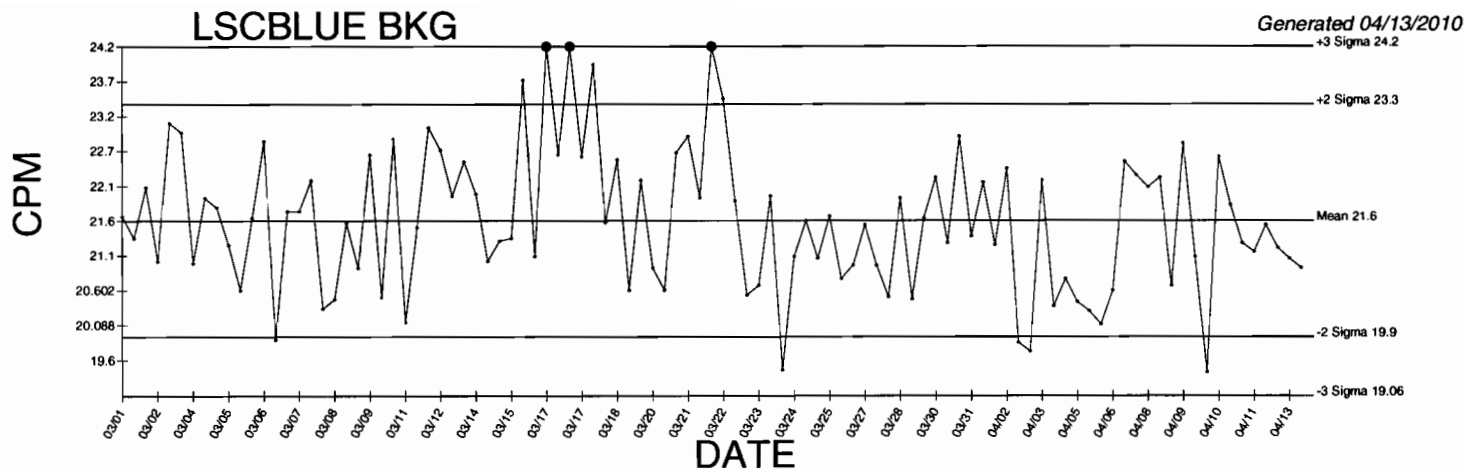


Sample Count Start Time:	9 Apr 2010 02:05:33		
Data Capture Date	09 Apr 2010 02:19:21		
User Filename	S05040910-2A.XLS		
	U05040910-1A.XLS		
Spectrum Type	Log Counts		
User Number	05		
User Id	TRITIUM		
User Comment	BLUE		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	10-2	15.00
H#, Total Counts:	129.3	812	
Win1: Tritium - Start, End, Counts:	20	270	217
Win2: - Start, End, Counts:	0	990	763





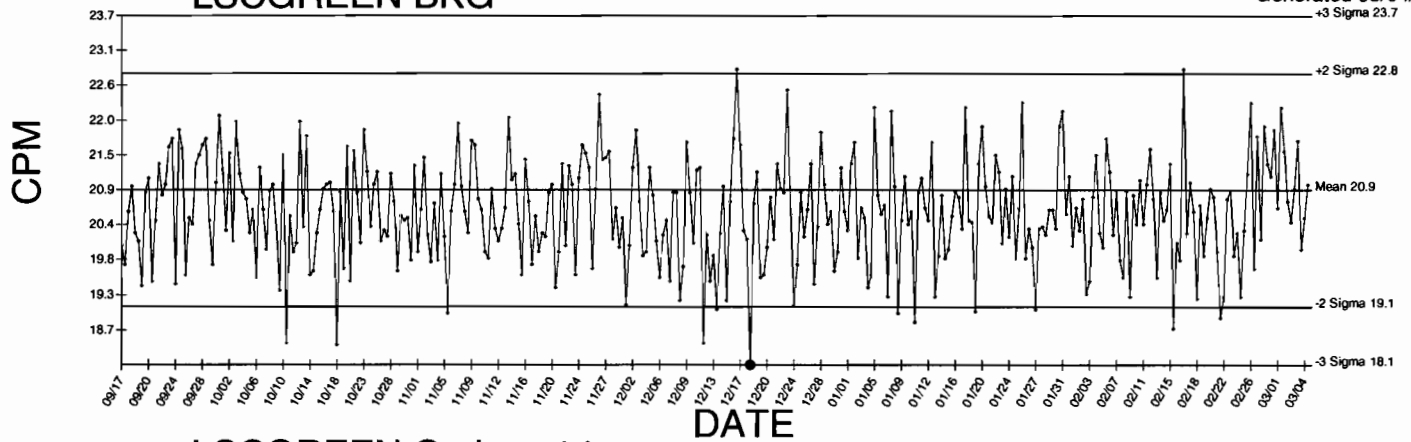
# BACKGROUND AND EFFICIENCY DATA



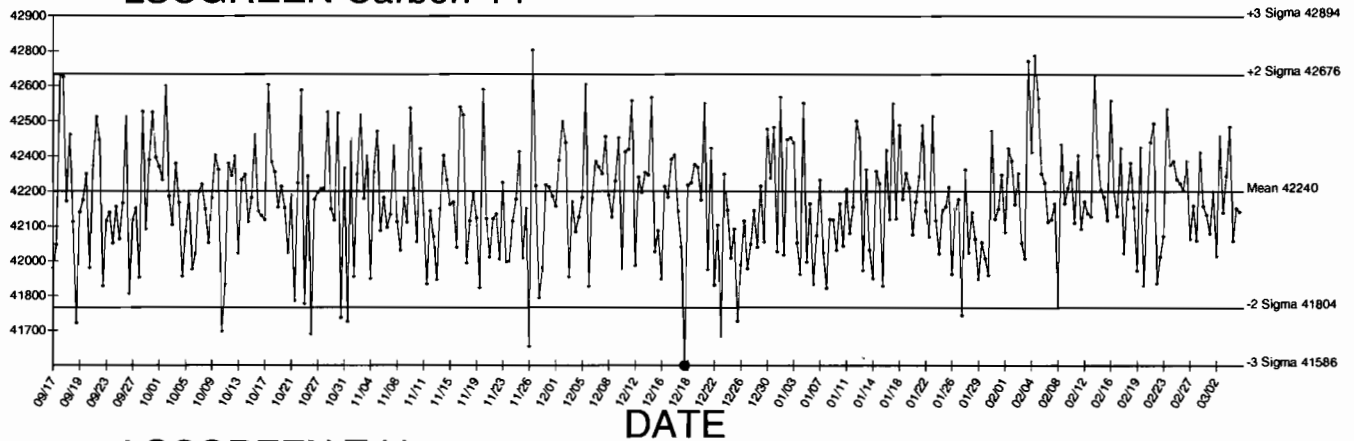
● Denotes Outlier

# LSCGREEN BKG

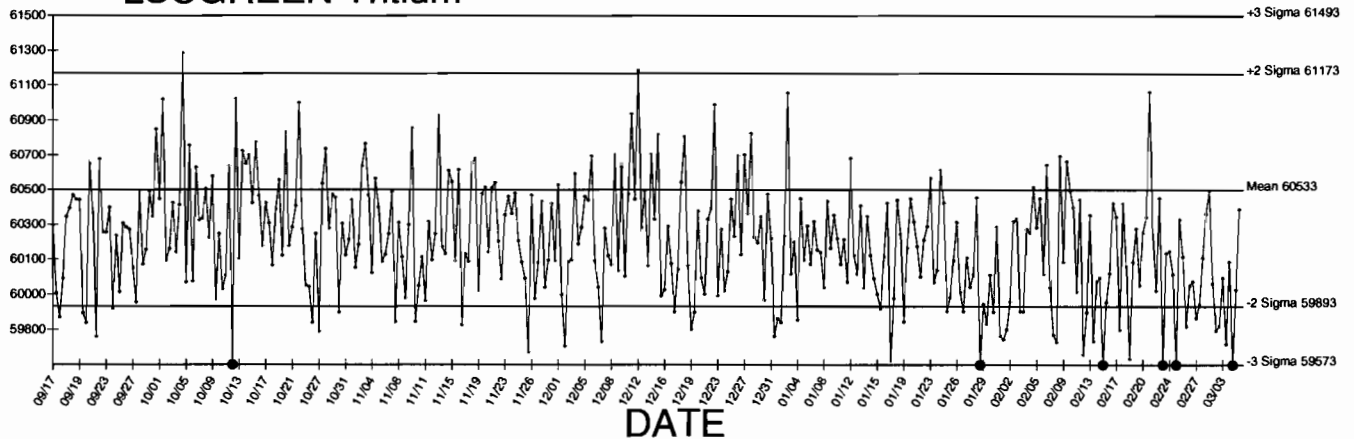
Generated 03/04/2010



# LSCGREEN Carbon-14



# LSCGREEN Tritium



● Denotes Outlier

# STANDARDS DATA

0134



CALIBRATION  
No. 0146

**Description** Radionuclide: TRITIUM (HYDROGEN-3) Product code: TRY-64  
Chemical form: water Batch: 111

**Measurement** Reference time: 1200 GMT on 1 March 1996  
Radioactive concentration of tritium: 488.0 kilobecquerels per gram of water  
which is equivalent to: 13.19 microcuries per gram of water  
or:  $2.93 \times 10^7$  disintegrations per minute per gram of water

**Method of Measurement**

This reference material was calibrated by direct comparison with a standard of tritium-labelled water obtained from the National Institute of Standards and Technology, USA.

**Accuracy** The OVERALL UNCERTAINTY of the result quoted above is estimated to be less than  $\pm 2.5\%$

This estimate of uncertainty was calculated in accordance with the recommendations of the International Commission on Radiation Units and Measurements (ICRU Report 12). The limits of uncertainty were taken as the arithmetic sum of the uncertainty due to random variations, calculated at the 99.7% confidence level, and the estimated systematic uncertainties.

**Purity** No radioactive impurities were detected. (Impurities with total activity greater than 0.001% of the activity of the tritium would have been detected).

**Physical Data** Half-life of tritium:  $12.43 \pm 0.11$  years  
Maximum beta energy of tritium: 18.6 keV

**Remarks:** The S.I. unit of radioactivity is the becquerel.

1 becquerel (Bq) = 1 nuclear transformation per second, therefore  
1 curie (Ci) =  $3.7 \times 10^{10}$  becquerels exactly.

Useful conversion factors are:

1 microcurie ( $\mu\text{Ci}$ ) =  $3.7 \times 10^4$  Bq = 37 kilobecquerels (kBq)

1 kilobecquerel (kBq) = 27.027 nanocuries (nCi)

This product meets the quality assurance requirements of NRC Regulatory Guide 4.15 for achieving implicit NIST (NBS) traceability as defined in NCRP58 (1985).

Approved  
signatory

*W. F. Case*

2C-5-023-061a

**Amersham**  
The Health Science Group

# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0134	Isotope:	Tritium
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	DI WATER	Prep Date:	02/21/2001
Reference Date:	03/01/1996	Verification Date:	09/10/2008
Ampoule Mass (g):	5 g	Expiration Date:	03/27/2010
Uncertainty:	+/- 2.5 %	Primary Code:	0134-A
LogBook No:	RC S 023 061	Dilution(mL):	100 mL
		Mass of Parent(g):	3.3659 g
		Density(g/mL):	1.0004
		Balance ID:	38080204

## Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(3.3659 \text{ g}) * (488 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 985535.5200 \text{ dpm/mL}$
$(3.3659 \text{ g}) * (488 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0004 \text{ g/mL}) / (100 \text{ mL}) = 985180.3116 \text{ dpm/g}$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
07/20/2004	Amanda Fehr	5.86	1000	0134-H	5773.1566 dpm/mL	07/25/2006	07/25/2007
12/20/2005	Amanda Fehr	5.5451	1000	0134-I	5462.92 dpm/mL	12/20/2006	12/20/2007
07/11/2007	Daniel Roy	5.5863	1000	0134-J	5503.5128 dpm/ml	07/29/2008	07/29/2009
03/25/2009	Mary Aders	5.4917	1000	0134-K	5410.3147 dpm/ml	03/27/2009	03/27/2010

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## Standard Traceability Log Rad

Source Material Info	
Parent Code:	0134
Prepared By:	Angela Johnson
Carrier Conc:	DI WATER
Reference Date:	03/01/1996
Ampoule Mass (g):	5 g
Uncertainty:	+/- 2.5 %
LogBook No:	RC S 023 061

A Solution Material Info	
Isotope:	Tritium
Prepared By:	Angela Johnson
Prep Date:	02/21/2001
Verification Date:	03/27/2009
Expiration Date:	03/11/2011
Primary Code:	0134-A
Dilution(mL):	100 mL
Mass of Parent(g):	3.3659 g
Density(g/mL):	1.0004
Balance ID:	38080204

## Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$

$(3.3659 \text{ g}) * (488 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 985535.5200 \text{ dpm/mL}$

$(3.3659 \text{ g}) * (488 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0004 \text{ g/mL}) / (100 \text{ mL}) = 985180.3116 \text{ dpm/g}$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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07/11/2007	Daniel Roy	5.5863	1000	0134-J	5503.5128 dpm/ml	07/29/2008	07/29/2009
03/25/2009	Mary Aders	5.4917	1000	0134-K	5410.3147 dpm/ml	03/11/2010	03/11/2011

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# Verification for H-3 Standard 0134-K

M. Aders	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Source DPM/mL
4/9/2009	0134-K N1	1097.2000	54.0000	1043.2000	0.380548	2741.3099
	0134-K N2	1073.2000	54.0000	1019.2000	0.380548	2678.242955
	0134-K N3	1085.2000	54.0000	1031.2000	0.380548	2709.776428
Mean Value (Counting) =	2709.776428		104.854429	Pass		
Stdev =	31.53347278		0.01163693	Rule 3 (Pass/Fail)		

Certificate Value = 2581.86 dpm/mL  
 Lower Limit = 2646.709482 dpm/mL  
 Upper Limit = 2772.843373 dpm/mL  
 Rule 1 Pass/Fail Fail \*exception taken due to full recovery of standard  
 Two sigma = 63.06694556 dpm/mL  
 10 % of Mean = 270.9776428 dpm/mL  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for H-3 source 0134-K by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. Ten mL of Ecosint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ecosint Ultra liquid scintillation cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on Silver for H-3 source standard verification. The H-3 efficiency calibration which was used for verification calculations was performed on 4/9/09 using 0020-A (H-3). Calibration data is recorded in this logbook under H-3 0020. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Handwritten: 4/12/09  
 Amanda J. Lehn 4/9/09



# Verification for H-3 Standard 0134-K

Standard	Detector Eff	Mass. Used (mL)	Source DPM/mL
1.0000	0.44203446	1.0000	2358.639627
1.0000	0.44203446	1.0000	2474.920154
1.0000	0.44203446	1.0000	2496.185464
Average =			2443.248415

G. Ramsay	Isotope	Detector CPM	BKG CPM	NET CPM	Pass
3/11/2010	0134-K N1	1081.2000	38.6000	1042.6000	1042.6000
	0134-K N2	1132.6000	38.6000	1094.0000	1094.0000
	0134-K N3	1142.0000	38.6000	1103.4000	1103.4000
Mean Value (Counting) =	2443.248415		99.4273605		Pass
Stddev =	74.04078992		0.03030424		Rule 3 (Pass/Fail)

Certificate Value =	2457.32	dpm/mL
Lower Limit =	2295.168835	dpm/mL
Upper Limit =	2591.329895	dpm/mL
Rule 1 Pass/Fail	Pass	
Two sigma =	148.0815798	dpm/mL
10 % of Mean =	244.3248415	dpm/mL
Rule 2 (Pass/Fail)	Pass	

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for H-3 source 0134-K by transferring 1.0 mL portions of the standard into glass liquid scintillation vials. Ten mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on Brown for H-3 source standard verification. The H-3 efficiency calibration which was used for verification calculations was performed on 3/11/10 using 1222 A (H-3).

Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

*Handwritten signature and date:*  
3/18/10  
3/18/10

# RUNLOGS

# Instrument Run Log

**Instrument Type: LSC**

**Batch ID: 956740**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
247185001	SAMPLE	KXK2	LSCGREEN	02-MAR-10 18:14	DONE		
247185002	SAMPLE	KXK2	LSCGREEN	02-MAR-10 19:53	DONE		
247185003	SAMPLE	KXK2	LSCGREEN	02-MAR-10 21:31	DONE		
247185004	SAMPLE	KXK2	LSCGREEN	02-MAR-10 23:09	DONE		
247185005	SAMPLE	KXK2	LSCGREEN	03-MAR-10 00:47	DONE		
247185006	SAMPLE	KXK2	LSCGREEN	03-MAR-10 02:25	DONE		
247185007	SAMPLE	KXK2	LSCGREEN	03-MAR-10 04:03	DONE		
247185008	SAMPLE	KXK2	LSCGREEN	03-MAR-10 11:14	DONE		
247185009	SAMPLE	KXK2	LSCGREEN	03-MAR-10 12:52	DONE		
247185010	SAMPLE	KXK2	LSCGREEN	03-MAR-10 14:30	DONE		
247185011	SAMPLE	KXK2	LSCGREEN	03-MAR-10 16:08	DONE		
247327002	SAMPLE	KXK2	LSCGREEN	03-MAR-10 17:46	DONE		
247356001	SAMPLE	KXK2	LSCGREEN	03-MAR-10 19:22	DONE		
247356003	SAMPLE	KXK2	LSCGREEN	03-MAR-10 19:34	DONE		
247356004	SAMPLE	KXK2	LSCGREEN	03-MAR-10 19:36	DONE		
247356006	SAMPLE	KXK2	LSCGREEN	03-MAR-10 19:42	DONE		
1202051375	MB	KXK2	LSCGREEN	03-MAR-10 19:56	DONE		
1202051376	DUP	KXK2	LSCGREEN	03-MAR-10 21:34	DONE		
1202051377	LCS	KXK2	LSCGREEN	04-MAR-10 00:21	DONE		

# Instrument Run Log

**Instrument Type: LSC**

**Batch ID: 973351**

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
247356002	SAMPLE	GXR1	LSCBLUE	08-APR-10 19:36	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
247356005	SAMPLE	GXR1	LSCBLUE	08-APR-10 20:39	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
247356007	SAMPLE	GXR1	LSCBLUE	08-APR-10 21:41	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
247356008	SAMPLE	GXR1	LSCBLUE	08-APR-10 22:44	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
1202091026	MB	GXR1	LSCBLUE	08-APR-10 23:46	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
1202091027	DUP	GXR1	LSCBLUE	09-APR-10 00:49	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
1202091028	MS	GXR1	LSCBLUE	09-APR-10 01:49	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00
1202091029	LCS	GXR1	LSCBLUE	09-APR-10 02:05	DONE	10mL DW/13mL Ecoscint Ultra	21-AUG-09 00:00